





Journal
of the
Royal Naval Medical Service



Journal
of the
Royal Naval Medical Service

VOL. LIX
1973

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The JOURNAL is published three times a year, three numbers comprising one volume.

Subscription

For RN and RNR medical and dental personnel on the active or retired list, and for Commandants to the Royal Navy, the subscription is £1 per annum (post free) payable on January 1 of each year. Single copies 50p.

For all others who are not in the above categories, the subscription is £2.40 per annum (post free), or 80p per single copy.

Cheques and postal orders should be crossed 'Lloyds Bank Ltd' and made payable to the Editor, The Journal of the Royal Naval Medical Service.

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THE EDITOR,

JOURNAL OF THE ROYAL NAVAL MEDICAL SERVICE,

INSTITUTE OF NAVAL MEDICINE,

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Wm. C. Harris, JR., Major, USAF

EDITORIAL

A recent article in the Times has drawn attention to the successful character for change which now affects everyone in every walk of life. Many feel that the greater the rate of change, the less trouble it seems to be to get on these most subject to the times, now. As change is nearly always imposed by Authority, this can lead to a feeling of business and economy as costs and customs inevitably build and highly respected ones to get things right.

Certainly changes are affecting the profession of Medicine and most sincerely do we, just as medical knowledge itself is changed, so does the immediate need to join in it. Besides, to our patients who provide after all the only reason we are here in all but who sometimes seem to be forgotten in the drive to produce a tidy, well-managed organisation.

The pressure for change now appears to be felt in every aspect of the profession — from the composition of the General Medical Council itself, to the hours of work of medical students. More, of these changes will undoubtedly bring about better work, more knowledge, greater opportunities, etc. — possibly, one suspects a professional fee is demanded for better pay — but they will not alter the basic need for a doctor to be attuned to the needs of his patients

to have a sympathetic and understanding insight into his problems and, as patient, to want to make the patient feel better for having consulted him.

At the moment we are creating, some measure, some rather more especially the result of the differences of a number of committees at various levels the findings of which may well affect the career of all who subscribe to this Journal. In rightly attempting to order our own affairs so as to gain the maximum efficiency from the medical manpower available to the Service — to remove the possibility of medical officers with the right training, the right equipment and the right prospects — we must not forget the immediate simple needs of that sort of patient who is always with us. The one that never gives up at too the exigencies of the career that trying to cope with a family problem and his job, or the depression of the young mother lonely and homeward overseas — there is, where our responsibility ultimately lies. If we have been able to bring such people a degree of comfort, the exact mechanism of provision, to direct specialist help and worry us so much, and our old-fashioned skill and devotion to the art of medicine will continue to provide their own support and job satisfaction.

THIRD SYMPOSIUM ON NAVAL MEDICINE

The above Symposium will be held at the Royal College of Physicians, London on the afternoon of Thursday, November 8 and all day Friday, November 9, 1973.

A brief outline of the programme is as follows:

Thursday, November 8

1415 Opening Ceremony
1430-1715 Session II: DOCTRINE/GENERAL
ISSUES

1730-1830 Film: COLD-CAN KILL
1845 RECEPTION (Tickets £3.75)

Friday, November 9

0930-1230 Session III: CLINICAL
PATTERNS

1230-1400 LUNCHEON (Tickets £1.25)

1430-1645 Session III: SOCIAL
PROM. FREE

1645 Closing address

A series of exhibitions will be presented throughout the Symposium covering a wide variety of naval medical subjects. In addition there will be an exhibition in the Main Library of the College. The theme of the exhibition, which will run for three months as part of a series of College exhibits, will be Trend and Experience with particular reference to Naval Surgeon Subspecialists.

Refreshment and coffee will be provided on both days without charge. A light lunch will be available between 12.15 and Friday, November 9 and there will also be tea facilities on a cash basis.

Programmes and tickets for the Reception and Lunch may be obtained from the General Office, Institute of Naval Medicine, Alverstoke House, PO8 1DA.

DEATH AFTER RESCUE FROM IMMERSION IN COLD WATER

By Frank J. C. Gellera

Introduction

There are numerous examples in the literature of people dying, shortly after rescue from immersion in cold water (Crychley 1983; Guyon-Brechoff 1984; McCann, Doolley, Condit and Widdowson 1984; MacNally 1985) and even after rescue from water warmer than that which caused around the shores of the British Isles except in the most exceptional cases (see Chalmers 1985). Although partial drowning may explain some of these deaths, in others, it can be safely excluded. The exact cause of such deaths has never been finally established, although some experimental work suggests that they are due to cardiac failure (Alexander 1983). Unfortunately there has never been an ECG machine available to study the right moment to determine the precise nature of the final cardiac arrest. The following is an account of one such death when the point was being cinematographically monitored in detail.

The Incident

Last summer an open sailing boat capsized in the English Channel and deposited the five occupants one by one and four remainers ended in the sea. Apart from the crew the sailors were very inexperienced sailors and although a crew passed them to be subsequently rescued for safety to resuscitate water in the conditions that found. All were wearing lifejackets which were fully inflated after the capsize. They had been in the open boat for approximately 15 hours before the capsize during which time the weather rapidly deteriorated. The light rain had been falling when

they first set out intended to expand to water and before the capsize. The wind blew from around around, with force 3 while the waves built up to reach 1.5m high shortly before the capsize. The air temperature was 11.5°C then, both and the sea temperature was about 13°C. The crew who subsequently died were members A and B, who both were hanging under a canopy when at the bottom of the boat driven, rapidly for 1 or 2 hours before the capsize. These survivors had apparently stopped just before the capsize and both appeared to be asleep immediately after capsize both A and B were very much in the air appear to be able to understand the movements of the men in charge of the boat. A drifted away, and had to be dropped back to the boat. He was helped up on to the open boat and he was in the water with open-mouthed eyes.

After about 30 minutes in the water a rescue helicopter arrived on the scene and picked up A and another of the survivors. At about the same time surface craft rescued B and the remaining two. B was found to be floating in the water and did not respond to 30 minutes of rapid resuscitation.

In the helicopter A had a very apparent and a very bright but had stopped breathing. Despite the resuscitation was carried. The other survivors in the helicopter was driven calmly. About a dozen found A to be deeply unconscious with a very erratic appearance and with regular shallow respiration. A was just about pale was present, the pupils were dilated but were not fixed for colour. He was very cold to touch but was not shivering.

Officer was given by criminal work, as he was in hospital and his father in prison.

On admission to hospital he was extremely cold peripheral vasoconstriction. Pulse and heart sounds were silent and blood pressure and temperature using a standard clinical thermometer unobtainable. Even spontaneous respiration was noted and his pupils were dilated. The pharynx which contained some mucus was noted but he was intubated just before and received carbon dioxide. Five hundred ml 4.5 per cent sodium bicarbonate, 100 mg indomethacin and 500 ml dextrose saline were given successively. A further 500 ml of the sodium substituted citric-saline fluidation which drops and 10°C shock did not reverse. Forty minutes after admission he was pronounced dead when spontaneous respiration ceased and the pupils were dilated. Hypothermia of 21° centigrade had elapsed from the time of entry to death.

At autopsy the air passages were found to be filled with froth and both lungs were distended and waterlogged with petroleum in the vascular spaces. Cause of death was noted as *Asphyxia due to drowning in salt water*. Necropsy on crew member B revealed identical findings and the cause of death was the same.

The other three survivors displayed varying degrees of anoxia for some after the capture, while one only remained afloat from the time he was in a hot tank in hospital 2-3 hours after rescue. All three were described as showing no colour.

Discussion

Because body temperature was not measured with a fine reading thermometer on admission to hospital there is no definite evidence that any of the victims were hyperthermic, but there is strong circumstantial evidence to suggest that this was so.

The environmental conditions were undoubtedly conducive to hypothermia while

the inadequate clothing worn by the victims would do little to offset an development. The symptoms and eye witness accounts leave little doubt that varying degrees of hypothermia were present among the survivors and that hypothermia was more than likely the cause of death of crew members A. The indications are that both A and B were hypothermic before the capture. The explanation why these two in particular should have been more susceptible to the environmental conditions than the other two youths who were almost clinically drowned and had similar body dimensions is more than likely due to the vasoconstrictor changes and shivering associated with the vasoconstrictor which immobilised them.

Signs and Symptoms — The normal shivering response to cold in man increases to such a maximum at a deep body temperature of 35°C and is gradually replaced by muscle rigidity at a deep body temperature of about 31°C (Alexander 1945; Pugh 1966; Burton and Johnson 1955). The disappearance of the shivering response in crew members A and B would be attributed to an increase in their body temperatures but an environmental study later determined it would seem more likely that their temperatures decreased. The observation in their mental condition supports the supposition. Intoxication and possibly are frequent symptoms of accidental hypothermia (Pugh 1966; Finerman & Pugh 1968) and tend to occur at rectal temperatures of 35.5 to 37°C and should be considered as an important sign of impending crisis in a hypothermic environment.

Drowning Hypothermia — When the deep body temperature reaches 30°C anoxia supervenes (McQueen 1955) and below 31°C the pupils become very dilated (Grogan & Ross 1963). Somewhere between 31°C and 29°C consciousness is lost (Fahrig 1955). Below 28°C respiration ceases

tion is likely to occur if the heart is mechanically stimulated while below 70 °C fibrillation is likely to occur spontaneously (Kemp 1953).

The survivors of this accident exhibited varying degrees of cyanosis, while one member, A, exhibited dilated pupils and unconsciousness before developing ventricular fibrillation.

Ventricular Fibrillation. As the exact cause of onset of the ventricular fibrillation is uncertain, one cannot rule out the possibility that it was not produced directly by the cold but caused either by asphyxiation or by external cardiac massage either of which is likely to produce fibrillation in a cold conscious myocardium (Kemp 1953). Unfortunately the absence of a peripheral pulse measurement in hospital cannot be accepted as proof of cardiac arrest being present at this time as with the severe peripheral vasoconstriction and prolonged hypothermia in deep hypothermia peripheral pulses are extremely difficult to palpate. But whenever the cause of the fibrillation is not the initial event and circumstantial evidence suggests that cold played a significant role in its production.

Drowning. Assuming therefore that hypothermia was the direct or indirect cause of death, the presence of pulmonary oedema found at autopsy requires an explanation. Looking at the death was noted at many of the Duxford victims it would temperature as high as 30.8 °C (Allender 1945). Weyburn (1947) records another case of foam coming at the mouth on a pilot wearing a jumpsuit after a 30 minute immersion in the sea at a temperature of 15 °C. Pulmonary oedema has also been noted in hypothermic bull walrus, in which there could be no question of partial drowning (Prosser and Pugh, 1959). In view of the fact that ventricular fibrillation is not typical of man drowning in salt water (Kemp 1953) and that dogs drown-

ing in salt water died from simple cardiac asystole (Gibson and Spafford 1951) it is considered that drowning was reasonably to be dismissed as the cause of death in this case. However, partial drowning is an obviously a problem in the past immersions (Haines 1951 and Lee, 1954).

Treatment. Unfortunately, as hypothermia was not suspected at any time as being a possible 'secondary condition' no effort was made to rewarm the patient. Had the patient been rapidly rewarmed defibrillation might have been more successful as the fibrillating heart is probably as resistant to defibrillation until such time as the deep body temperature rises above 30 °C (Grew, Koon and Bennett 1959).

Conclusions

The case does not provide an explanation as to the cause of death of those who die shortly after rescue from a period of immersion in cold water. It does however suggest that ventricular fibrillation is likely during this period and every effort should be made to avoid unnecessary man handling of the patient during the critical phase in order to avoid entrance of the cold untreated myocardium.

Acknowledgments

I wish to thank the Medical Director General (RAF) for permission to publish this report. I would also like to thank Lieutenant DMS W. J. Baker RN who assisted me in my investigations.

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DISCUSSION FOLLOWING COLD/WET SURVIVAL SYMPOSIUM HELD ON NOVEMBER 4 & 5, 1971

The following abstract have been taken from the lively and interesting discussion which followed the presentations at the above Symposium. The questions and answers have been published as recorded in order to preserve the discussion and emphasis of the discussion and thus bring the message as an informed but clear one. We inevitably have our gaps and our 'vagaries' in any such unscripted comments and the abstract is not offered as a verbatim paper, but rather as a most readable guide to current thinking and in order to encourage readers to take an interest in the problems and arguments put forward by the participants.

It will be noticed that very early on again the discussion stresses that it is necessary to distinguish between acute hypothermia for which rapid re-warming is the treatment and chronic hypothermia in which such treatment is likely to be fatal (Childers).

Discussion Point

Surgeon Captain D. F. Crocker: Do channel swimmers and duck divers have a safe zone and does it do any good?

Professor C. R. Warren: Yes, they do. Opines has discussed in how much cold tolerates a goose. The first finding was that compared with several centimeters of subcutaneous fat which was firmly anchored in place a few millimeters of goose (chub) will do as by the time they have swum a few minutes make very much difference. That was recorded by Pugh & Edholm (1952) and they came to the impression that, although it is not going to make a relevant difference, it probably is significant that they also put it on for the sake of avoiding chills and salt water

water which otherwise are quite likely to occur when swimmers stay for hours on and in cold water. I have heard of the odd one who doesn't see goose, but the next morning will do.

Surgeon Commander D. B. Mackay: Can I just add that I was involved with the training of our channel swimmers and came into contact with several others. I found that they didn't see goose as the training went, even if the training was in the sea for 8-12 hours swimming. They felt used to the actual cross channel part, I am not at all sure that in fact, there is any significant physiological benefit. Perhaps there is a psychological one.

Surgeon Commander J. M. Young: We have just been talking about salt water water, and fresh. Could the point be salt water immersion loss and the difference between that and fresh water?

Dr J. Naim: Freshness and immersion loss are two different conditions. Immersion loss is a product of long exposure over many hours to cold water near to, but not necessarily all that near to freezing in temperature. In that it is very different from frostbite. The real results are liable to be the same and the two conditions have been perhaps associated more than they should. In the progress of the pathogenesis of frostbite (Naim 1972) on the right hand side I had a graph which was reading as opposed to freezing it went through vaso-constriction, loss of sensation, pruritus, the sludging of the red cells, blocking of the capillaries and finally thrombosis. The sludging phenomenon is the pathogenesis of immersion loss and it

is not really the same as the lesser freezing of frostbite.

Surgeon Captain D. G. Bridgish: I have always found it difficult to draw a dividing line between frostbite and immersion injury. I have seen the effects of repeated mild freezing produce the hyperaemic reaction that you associate with immersion injury. In my own case I know that I had a particular finger frostbite and I got an ulcerative response now when it is immersed in cold water, but there was not an immersion injury at origin; it was definitely a freezing.

Professor C. R. Hawes: In my experience of the frozen rifts which I have thought that immersion might be part of the same condition as frostbite, I am sure the more severe damage of frostbite is usually related to freezing of the tissues. The character and things about the immersion loss and of the symptoms is that it comes with prolonged exposure to a relatively quite mild degree of cold, particularly when that is associated with immobility. It does not necessarily require wet cold. This is important, is it not, when people sit still for quite a long time and not particularly that of the earlier rules with no offshore boaters where the survivors are exposed only by their clothes being nearly freezing on water. This is a situation where some degree of cold injury can occur even though the skin temperature remains far from below a limit of about 0° C. It is prolonged for some days and sometimes not resolvable. These immersion immersion frost injuries can take months and months to recover.

Professor W. R. Keatinge: My only personal experience of this has been limited to experimental freezing of the fingers, but I have referred immersion injury and this is the same basis for the comments I am making. I think the evidence is clear that freezing injury is produced by crystallization of water leaving behind a hyperosmotic

solution which causes cellular damage, particularly in the blood vessels, and this requires looking of plasma. In the case of immersion injury we know from the wartime reports that many hours of exposure to cold above freezing point were needed to produce this. What we saw in the water for only 1 hour in some cases but they were then several hours in cold and severe boats. Such immersion injury obviously produced muscle necrosis and nerve damage with the skin usually left intact, whereas in direct frostbite the skin is frozen and lost while the muscle remains normal. Apparently severe cases of frostbite were often associated with surprisingly little final loss of tissue, but severe immersion injury was often followed by permanent muscle contractures and nerve lesions.

Surgeon Rear Admiral J. Watt: I think that a good deal of confusion arises because people tend to think only in terms of frostbite. I can state that we should be thinking in terms of freezing cold injury and non-freezing cold injury, which are entirely different, probably in their aetiology and in their response. For instance, in the immersion injury there is the extreme degree of dependency and there is certainly a bigger nervous involvement than there is in the normal injury of the frostbite case.

Surgeon Captain E. S. P. Bowles: I would like to know about immersion frost as it was described in the 1914-18 War. Is the statement for that "rapid treatment"? Can anybody put a pin down on that?

Surgeon Rear Admiral J. Watt: A poor one, Sir. This would be harmful in view of the sodium and potassium sodium chloride and might produce severe swelling pain associated with the hyperaemic stage.

Dr J. R. Nelson: I would agree with that but only because there isn't any information to the contrary and it is extremely difficult nowadays to get information to the con-

ing. Let us hope it always will be. It is much easier to get information on living heat and that has shown that let that condition rapid rewarming is the best answer. Without that information you would kill yourself out. They usually passed in an extraordinary rapid rewarming even on the basis of experimental studies on animal facilities. I think what you are saying is in the absence of information about immersion heat, let us be safe and prepare slow or delayed rewarming. I absolutely agree, but bear in mind that it could be different if we had the data to go on.

Surgeon Rear Admiral J. Wain: I would like the opinion of the panel on the effects of rapid rewarming, of the whole body upon the life status of the end products of some combination water-miscible solutions also. When you get somewhere supportive treatment is required for a very high, rapid case? Now while I would agree that heat must be a central and should be conservative, as body damage is always less than one would imagine. I nevertheless feel that we haven't said anything at all about the supportive treatment that is required at the end line, and electrolyte, caloric.

Surgeon Captain J. S. P. Bardin: I personally am quite concerned and I think my colleagues are also. One has been treatment of immersion hypothermia, a rapid rewarming without any other form of supportive treatment. The Danish experiments showed very clearly that you could revive people who had really very low levels of survival otherwise. There were at least several cases who had already gone into cardiac arrest and who were treated with rapid rewarming only. In these cases they returned at 33°C if I remember correctly. These unfortunate patients had been deliberately cooled and they had total irregularity of rhythm before that cardiac arrest developed, yet several of them survived. I don't think anything else would

have revived them. For people who are at a low survival stage, rapid rewarming is a bulk at 43-45°C is my view the treatment of choice. Now supportive therapy is something which we certainly will have to go into and of course at a limited time one can't cover all these points.

Group Captain F. Whittingham: I think that not only is it important to know how to start but it is also important to know when to stop. What signs do you use to make up your mind that perhaps his gain on being rewarm? How do you rehydrate someone as well? Because most people in cold places have been breathing heavily and they certainly are mucus-moaning, certainly in cold exposures water-mixed form of body fluid. This whole person is not what to do immediately but when to stop and what to do next. It goes on my to say.

Ralph: I know what to do immediately but what do you do in the way of fluids?

Surgeon Captain J. S. P. Bardin: You can say that when a man is returned. But let me say a few facts and facts, his first priority by the first means available and his temperature starts to fall as a rule. There is a drop although the body is hot. As his peripheral circulation comes up, it picks up heat from the body and in this is what saves his life and prevents the after drop of temperature and raises his temperature to run upon. Now in the animal immersion experiments done at the RN Air Medical School, after a man's temperature started to rise again he was taken out of his hot bath and allowed to warm up through his own metabolic heat generation. It worked very well partly because by doing so all the cold, the when does also prevent death. You might say "Wait, when the deep body temperature goes back to where it was before" but this is not exactly logic.

Group Captain F. Whittingham: While I just said here, one thing about the fluids, I don't know but I expect most of us have

have used warming and it happens to be a messy and messy operation and often let alone keep a limb out you are lucky if you keep the main nose and mouth out of the water. Either you are holding it there with your hand as you have rigged up some contraption to do it. As you can imagine there are potential difficulties of getting to the location of maintaining the limbs out of the hot water. Just getting the patient warmed up seems to me to run the risk of being too subtle. I recall Curran, Lake and Cooper, who found I think that heating one part of the body alone might not be a very wise thing to do if the person is not extremely cold and I think a lot of the people who would be requires treatment may not be in the category of our very cold survivors who have been fished out of the sea. I have a feeling that if you are up against it you may well be driven to heating the man up as quickly as possible and it may be better to know how to do that than perhaps to leave parts of the body out.

Surgeon David J. G. Buchanan. I would like to ask of anyone can differentiate between the treatment of what I call hypothermia and heat stroke hyperthermia? My own experience is in warming old people in London who were hypothermic. I wonder if you tried to treat them rapidly in a hot bath they were into vascular difficulties.

Professor G. R. Hawley. I think Admiral Webb and Surgeon Lieutenant Buchanan have both raised an extremely important point which certainly has not been dealt with so far in this Symposium. Chronic hypothermia is quite a different thing from acute hypothermia. In acute hypothermia I refer to sporadic where people have lost heat rapidly as a result of division, certainly our focus is cold water, and I think there'll have to be abundant evidence that rapid re-warming, which if possible should be con-

ducted in the tank, is the right treatment for acute hypothermia. My chronic hypothermia I recall a situation where the person has got down to a dangerously low core temperature by cooling severely slowly and therefore in previous things at sea about two people who have been exposed on battlefields or on mountains or snows or even in leaky cribs, and this is a more complicated condition. It always produces a terrific haemocoagulopathy. I think myself this is not so much due to loss of water outside the body as to a body fluid volume depletion such that the extreme vaso-contraction in the peripheral tissues leads eventually to a disappearance of fluid from the circulation. Chronic hypothermia also produces a severe metabolic syndrome which is believed to be due to metabolic waste metabolism. Trepan which are still slow enough to metabolize are not getting sufficient oxygen and nutrients. There is slowed down impaired circulation. Both these things, the haemocoagulopathy and the acidosis, urgently require treatment. I have no personal experience in treating chronic hypothermia but there is quite a lot of literature particularly from the immediate post Korean War period when there were a lot of casualties exposed in the field and a lot of studies were made of both the chronic and some very acute methods of treatment. It does seem quite clear that rapid re-warming is not the correct treatment for these people because of the circulatory collapse. If somebody with a diminished blood volume is re-warmed and his peripheral circulation comes up there is an obvious danger of the blood pressure dropping to zero. So re-warming has to be conducted with great care, therapy the whole thing has got to be done extremely cool and really is a more difficult thing to treat.

Surgeon Captain J. S. P. Rankin. I think this is extremely important and an interesting point and relates us to the core of the

old ladies with chronic hypothermia. Time and time again the witnesses that were applied failed and eventually they died. But you have personal experience of this? What treatment did you in fact administer?

Surgeon General J. D. Buchanan: Mostly the patients had a temperature above 30°C (86°F). We put them in a warm bed and put up a devolved drip and gave them hydrocortisone and they would usually warm up. Below that temperature our would find that often they would go on working on spite of being in a warm bed. One or two of them we even tried to keep warm in a bath but almost invariably lost them.

Surgeon Captain J. S. P. Keston: When you tried to warm them as a first aid you often lost them on intravenous drip and cortisone?

Surgeon Lieutenant J. B. Buchanan: Yes.

Surgeon Captain J. S. P. Keston: Could we have some more facts on this?

Dr J. D. Nelson: The first time I met this was in the casualty department of University College a very long time ago before I even knew what hypothermia was. The old lady that came in succumbed within twenty five minutes of all treatment which we all rushed about trying to find a few minutes that would improve her temperature. There wasn't one in the hospital. What really shocked her was just stripping off her old clothes and putting on a night dress and putting her to bed and warming her.

Surgeon Rear Admiral J. Whit: I think it would be very helpful to us if we could make a distinction between acute and chronic hypothermia. Clearly the diagnosis of the illness is very important and therefore the treatment depends on whether you are going to reanimate the patient or not. If chronic warm slowly and support. Rapid if

reanimating in a chronic condition of a man who has been exposed for some time with metabolic analysis could be fatal.

Surgeon Captain J. S. P. Keston: Although I agree in principle with the view that we should be able to distinguish between chronic and acute hypothermia, it is very difficult to say where the distinction should lie. Consider the man who has been exposed on a hillside after one of those accidents that happen upon Dartmoor in the winter. Some body walks out of a car at the scene and when he is found an hour later has been in for ten hours there. The problem is deciding whether a man is acutely or chronically hypothermic. The treatment of acute hypothermia must be rapid reanimating but obviously one needs to do more than just warm for chronic hypothermia. If there is difficulty in distinguishing between the two you must have in mind the opinions voiced today and check on him when he awakes and so on and be prepared to supply supportive therapy depending on what you find. I feel it would be dangerous to say that one should not rapidly reanimate because I would suspect that you would lose several people in the meantime.

Surgeon Rear Admiral J. Whit: Rapidly reanimate only if they are acute. Old people cannot cope with rapid reanimating after chronic hypothermia.

Professor W. R. Keatinge: I absolutely agree with this. It is a very complicated situation and there are obviously many different situations that you are dealing with. But there are a few things which one can say with confidence. One is that if somebody has ended up the coast of London and they may be covered if seaweed what as long as one knows of them. Three-mile and people who have ended up near this point in cold water can probably benefit from rapid reanimate than slow re-warming. I would suggest that in the field

you probably wear out to constant rapid beating in the point of complete anoxia. (I) normal body temperature. One thing's usually known how long they have been cooled. There is lots of resuscitating time elapses during hypothermia and then comes in to real danger of severe hypothermia if people are suddenly warmed and vasodilate after long periods at low body temperature. Apart from an early start to resuscitating I would suggest that it is best to leave them alone as they warm up. If it stops, it is usually easy while the patient is hypothermic to give harmful treatment. For example to precipitate ventricular fibrillation by unnecessary insertion of a laryngeal tube or even intubated thermocouple. Further action may be needed if a patient deteriorates after getting back to near a normal temperature. He may then be hypophosphorous, may be acidotic may have a low blood pressure and if so he will benefit from correction of these. But during the actual resuscitation I think the evidence is in favour of leaving him alone if possible.

Surgeon Captain J. S. P. Rowden: So come from a cold he goes to our tent of a hypothermic. It is preferable to get more dry to be warm, but you might add that you must watch out for hypoxia, as you have difficulties here should he re-warm?

Surgeon Rear Admiral J. Watt: I was hoping that this is what would be said because that is the direction that needed to be made. I think so that we separate those two aspects of treatment. I think that has been very helpful and we are now clear in our mind as what stage one can have or at what stage one needs these supporting measures.

Surgeon Captain J. S. P. Rowden: You also could say nothing about the cold shock?

Professor M. R. Eastwood: It certainly has a temperature of 30°C-10°F with nothing else worse with them and you put them in bed in a warm room, they are

highly in recovery. I don't think there is a case for drastic treatment unless they are colder than this.

Surgeon Captain J. S. P. Rowden: I will just add one point to this. The people who are always dealing with it do not see frozen people are clumsy on land, instead currents. Anoxia has a habit of falling in the water and you get back a pint and maybe one or two others, and they are very very cold, very collapse and very frightened. They are usually shivering with shock rather than cold and when we used to do with them in Ark Royal and I know that this was also done by Surgeon Commander Macken as he then was in Ecuador to get them straight into a hot bath. By now and all, in fact we always give them a hot as well. This may not extended to do people particularly about the cold but a did give them hot their muscle and we started moving about peripheral vasodilatation when they were in a hot bath. (There of course were 15 young men with chest dystonia hypothermia). This was really a classical example of rapid rewarming but certainly it was a most successful treatment of cold as you, who are going and fit.

Lieutenant Colonel D. E. Wooley: In the Army in particular we have spent quite a lot of time unless during in training on how to treat. Nevertheless, it is, inevitably, that these men are, as you have deployed in a cold climate in short periods and then return, the Commonwealth Officers of war. At that time it was clear that effectiveness in time has not always effect on their recovery to represent in a cold climate and is quite to this.

Professor G. R. Harvey: Well, if say, thing this could be beneficial. There is a certain amount of evidence that preserves the temperature regulation system in other direction makes it more effective. Certainly there is no doubt about it.

Surgeon-Captain J. S. P. Rawlin: I think the only thing you can add to this is that we must do more about alerting Executive Officers to the dangers of hypothermia. In the particular case of people who have been seriously perturbed to leave the Commanding Officers should be aware that they must be properly clothed and know what to do if anything goes wrong.

Surgeon-Commander J. W. Young: What do you do with a ship's hypothermia patient if you have to see a few birds?

Surgeon-Captain J. S. P. Rawlin: The situation we would be in I think is up on the bridge where you had your hypothermia man and it may be a couple of hours before you can get him near a hot bath. On the carrier you pick up at the base of the Rio Rango range with heavy fog, you can undertake heavy resuscitating treatment. What do you do? Now that is about fairly vital to the Service. We must come to some sort of agreement on it. What has happened in the past, and what can be done to do, has always been to wrap the ship up and put him in the warmest equipment that you have and pour hot tea and so on into him. I suspect that if you do this you may be precipitating the man's death. If you have a man who is hypothermic but still alive, he is producing a certain amount of heat and if you prevent any further heat loss I suspect he may stay alive. If you do anything to open up his peripheral circulation then the amount of heat production he has got may no longer be able to cope with the cooling he is going to get by his circulation going to the cold peripheral parts of his body. I wonder whether you are not better at just maintaining his circulation so that he doesn't lose any further heat and transport him in a refrigerated state to the museum where you can start your resuscitating. I would like Professor Harvey to give his views.

Professor G. R. Harvey: We really do not know the exact answer to this. I am

quite sure that in the present state of knowledge the only advice you can possibly give is what we have just heard, namely to prevent the patient to become steadily though very slowly from his initial heat production. You have to judge this very badly. One can give a far more detailed advice about what is likely to be a neutral situation in which the patient is no longer losing heat or gaining heat eventually. I think it means wrapping with blankets and maintaining him in a food-free condition and doing absolutely nothing more than that. Going around asking to people involved in this sort of thing I have become more and more aware of a number of mistakes which do seem to suggest that to do anything more than that is bad. It is so natural to put him into a hot cabin and wrap him in blankets and hot water bottles and give hot drinks if he is conscious enough to drink, but this is really disastrous dangerous. If he is dangerously hypothermic to start with, which probably means an internal temperature less than 35 C or so and if you insist you have to a hot bath it really is very dangerous to go into any sort of hot measures. In the present state of knowledge the best advice you can give is really close resuscitating using artificial heat production only and doing no more than maintaining him to avoid further heat loss. But this is an area in which I think a research that more research should be done. My own feeling is that the first two directions in the Gorgon area for this kind of research are extremely good, and I very much hope that people here will press on with this. I think this one is a good point to do so. Guy has suggested, perhaps with this might help. I would like to see investigation of myocardial death as a means of central warming. The animal possibilities for the St Aubrey Smith's work at the Institute of Medical Research some years ago which was absolutely dramatic. This was in small

accidents which allegedly are under no strain or hypothermia. They were cooked to a point where quite a proportion of the animal's body was down to burning point and they could be regenerated by hardly anything heating the brain and central circulation by the diathermy system. There may be less sophisticated methods than that which apparently haven't been investigated. But could they have been there is no advice you can give to this question other than were you experimenting.

Surgeon Commander A. McCann: Have I got the note. Two notes put the animal hypothermic point is a bit high, a really low back which is going to be extremely uncomfortable or can be absolutely with me if you haven't got a low back? Is this some or extraordinary device of these men?

Surgeon Captain J. S. P. Rawlin: I believe this to be absolutely true. I think you are dealing with a potentially dangerous situation and you either put him in a hot bath or do nothing. When we say nothing we mean that you stop any further heat loss; you don't put him in a blanket but by the same token wrapping him in blankets doesn't heat him up, it only acts as an insulation between him and his surroundings. So don't put him in the hottest part of the ship or whatever it is. I think you keep him so that you allow his metabolic heat generation to do the best and you prevent further heat loss.

Surgeon Commander B. E. Mackay: As Lieutenant Commander Golden said at Sheffield Park this afternoon I don't think the hot bath will be painful though it would painful I think it is welcomed and in fact I am sure it is.

Wardmaster Sub Lieutenant R. Jovell: If any temperature is like let us all play and if the subject is a little cold ship is very temperate and not let and about the very temperate? Is there any way of injecting hot fluid water by mouth or

per rectum that might possibly be the first step in saving the life of a hypothermic patient? Or is an intravenous one?

Professor G. E. Horne: I would have thought that anything you can put in by the two routes you mentioned with the fluid at an acceptable temperature to give you heating is in the category where it is going to do more harm than good. It will simply be a rather standard and I don't say that anything else is a very effective way of stimulating thermoreceptors. Heating or diathermy results rather slowly from enough energy for convection, thermal and thermal and I would have thought that that was the worst thing you could do. Whether there is a theoretical possibility of it if you had the kind of heat exchange apparatus that you have an opening through the mouth by a rather narrow. It might be the ideal thing if you had it available but of course this is going to be the most sophisticated sort of apparatus that you could imagine.

Surgeon Captain J. S. P. Rawlin: I think we can now say that you don't give hot drinks to a dangerously hypothermic man. There is a great difference between him and the cold chap whose morale is extremely low. You can do all sorts of things for the hot chap but the great thing is to warm him up. I certainly agree with Captain (English) that alcohol is a menace for people under cold conditions who use it to an extent that they become cirrhotic as to what they are about.

Surgeon Lieutenant Commander B. G. C. Collier: It has been suggested that one way of treating a hypothermic victim in the field in the absence of sophisticated warming equipment, is by the bodily contact. Perhaps somebody has some personal experience of this or so I would like to hear it.

Surgeon Captain J. S. P. Rawlin: This is putting another body in the blanket.

Surgeon Lieutenant Commander B. G. C.

Geddes. You're not somebody whose autotranspiratory mechanisms are functioning normally to keep his arms and legs around the naked body of the hypothermic victim.

Surgeon Captain J. S. P. Huxford: I agree, and it seems physiologically obvious because you are now going back to partial rewarming.

Yes, I know the recommendation, but we are now again in one of the open fields, and we don't have enough evidence. One of the things which has come up very clearly from the Symposium is that we are having to make best guesses in a very limited amount of research. A lot of the research was done a long time ago and there isn't just as our knowledge where we can't do better than to use our advice on the best thinking available, and it is very controversial and we may be wrong. One thing that is really clear is that more research is needed to re-open the question of whether or not you probably warm a cold person in the absence of the chest incision.

That should be resolvable by animal experiments. It doesn't sound too difficult and this is something we shall consider.

Surgeon Captain G. R. Whitham: My don't have told that we can start the term *posture* in current usage of posture, the *chance* is there and that rate of rise, and we can start a circulation trouble. It makes sense that we haven't done some sort of methods of finding the rate temperature that is just I don't think you can find it in posture a finger up the normal. The posture of posture which comes to some of us is that we may not have a thermometer or other device better than 7 cm. What do you do?

Surgeon Captain J. S. P. Huxford: In these circumstances you should go for an oral temperature which I think is a very good indication. It comes down to the fact that if the man is seriously cold his oral temperature will certainly show it, and there I think you have to take your decision as to what is the most important measure.

SYMPTOMS AND SIGNS IN ACUTE HYPOTHERMIA

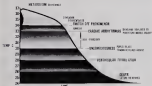


Fig. 1. A summary of the symptoms and signs in acute hypothermia.

The man may have some other injury. Very likely, but will it be a throw-off a bulbar? Perhaps again Professor Harvey would like to say some thing on the question of instrumentation.

Professor G. R. Harvey: I think, if one hasn't got thermometers, one has got to go on clinical judgment and one of the things you can certainly look for is the cessation of shivering and also the appearance of vasodilatation. Perhaps Surgeon Lieutenant Commander Collins would like to comment on that?

Surgeon Lieutenant Commander F. M. C. Collins: This is a symptom I make up from the signs and symptoms which appear in the literature on hypothermia (Fig. 1). If you take the body temperature of some body exposed to cold initially there is a slight increase and then the temperature falls slowly until it reaches about 35°C, it then drops fairly rapidly until there is a decrease in the temperature differential between the body and the environment which lowers the rate at which the temperature decreases. The shivering response starts slowly after immersion in cold water (increases to a maximum at a body temperature of 35°C and then rises through 34°C, 33°C, 32°C). So that perhaps a one symptom you can judge the degree of shivering the individual is experiencing. Below 33°C the shivering is replaced by a sort of tonic spasm, where the muscles are in spasm. You can imagine the freezing of every muscle in your body. That sort of apparatus is absent and that will tell you that the temperature is really down to the low 30s. The person begins to get confused about 33°C and a lot of convulsions and behavioural changes occur. I have used the phrase "state of phenomenal" freezing has been reached (personnel rather than talk about rigidity and other medical terms). They understand what you mean if you replace the person with him into himself to switch off his brain interest in every-

thing else that is going on. That occurs at about 34°C or thereabouts. Then the patient starts getting morose. Superfrostbite, the cardiac arrhythmias are likely to occur at 33°C or below and ventricular arrhythmias are likely to occur at 28°C, 29°C or thereabouts. Pupils dilate at about 35°C and the tendon reflexes are absent for from distal up to you can make a rough guess at what the temperature is.

Professor G. R. Harvey: It is a very busy body is aware of a method of measuring deep body temperature as proposed by Pugh if the subject is conscious and able to give some time, you then use the same temperature with a low reading thermometer. This is a very good way of getting a core temperature, is almost constantly lower than rectal temperature and of course is easier to do under field conditions. Can I show you a thermometer? There are much more expensive than the ordinary thermometer but I think myself they are worth it. They are very useful of course for experimental work as well. This one is a skin or environmental temperature meter but it could be used on hypothermic people for doing rectal temperature where you don't want immediate precision but you want to know what the position is. Its great advantage is that with a cone in place you can fix a sensor what is going to work absolutely as further disturbance of the patient and with continuous availability of the information. I think anyone who is expecting to have to treat hypothermic patients would be very well advised to get one or two of these instruments, and probe a various range. They are very portable.

Surgeon Captain J. N. P. Rawlins: I think we have just about reached the end and Admiral Watt has pointed out that we ought to make some distinction between freezing and non-freezing and injury between acute and chronic hypothermia and between the rewarming phase and the rewarming phase and the treatment that

gone with them. Probably we have covered enough ground to have a fairly good idea about how to handle these things, except again on the question. Dr Nelson has clearly shown that the best freezing injury should be treated by rapid rewarming in 42-45°C water. For the non-freezing injury the immersion foot, trench foot type of injury, we are not so certain. Theoretically one might warm the body up without warming the foot but it seems that the correct treatment for non-freezing injuries is not rapid and active rewarming of the affected limb, which might do more harm than good. Active hyperthermia without question must be avoided by rapid rewarming. For chronic hyperthermia I would be inclined to rapidly rewarm to the core of young subjects, but others might not. I don't think enough is known about that. What is quite certain is that both measures must not be used. This could be disastrous. After the rewarming phase one must use the best clinical means available to rewarm and to treat wounds and fluid imbalances but it would seem that you shouldn't start also during the stage of rapidly rewarming them for these acute complications.

Surgeon Captain D. G. Dalgleish: May I make one plea. I don't think enough on nutrition has been written or presented. I don't deny one word that you have said about nutrition but I think that the Canadian Forces Medical College in a desert and Service is in a far better position to present them than I do. We should have discussed nutrition, on what presented should do and should not do.

Surgeon Captain J. E. P. Ruchon: You are absolutely right. This of course is enormously important especially in the Service, nutrition rather than just prevention of hypothermia is really what part of the rest to Seafield Park was about. The equipment isn't but it has to be worn. Prevention is especially important in cases of full walkers, and politicians. Time and

time again when these people die they are inadequately clothed and they didn't carry out the instructions which you said were so vital in the Antarctic. What is equally important here is that one must cater for the worst conditions and if one doesn't that one has only oneself to blame. The worst one may look good when one gets out, but later weakness may demonstrate because of rain and one may lose one's way and perish because one didn't carry a compass.

The symposium then closed with **Surgeon Major Ashurst J. Watt**, Medical Officer in Charge, Institute of Naval Medicine and making the final comments. After thanking all those who had taken part and who had helped to make the meeting a success he said: "When we decided to run this series of symposia we were aware of the sort of support that we might receive and the type of appeal that these subjects would have. But at least the support that you have given us has confirmed that we ought to continue and we have in mind a number of subjects of great interest to us all. Both General Duties Medical Officers and hospital doctors. We are all members of the Services these matters are of a general interest to us and we hope that we will soon be able to announce what should be an attractive subject for the next symposium. Secondly I think I should say how much we appreciate the support of our Army and RAF colleagues, and this gives us an opportunity of underlining the fact that the Services do cooperate better than it is imagined for us to collaborate in fields of mutual interest. I am sure that one of the things that we have learnt from this symposium has been that collaboration should occur particularly in the research which is going to come from some of the unanswered questions that this symposium has provided."

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NORTHERN IRELAND — SEPTEMBER-OCTOBER 1972

By John Lawrence-Green

TE left their everything, I saw them's little in relief
(Through the Looking Glass)

AMBULANCE

On return from Mourne, a period of a few weeks between appointments was spent as detached duty with the Royal Army Medical Corps in Ulster. The previous one involving the Regimental Medical Officer in Belfast and the Border are discussed, and the medical situation as regard to casualties is noted.

Introduction

The latest circumstances, as mentioned in the original issue, placed RMA Green at Bess in November 1966 (Acher 1968) and during the military coup in Azores, Ghana in February 1968-Lawrence Green 1967). Northern Ireland offered a third opportunity of medical management and experience of injuries by bomb or bullet wounds in 1972. During September and early October, lecture appointments were held at RMA to 40 Commando Royal Marine, based between the Ardara, New Lodge and Shankill districts of N Belfast, to the Prince of Wales Own Regiment of York, based at Palace Barracks, Hollywood, E Belfast, as 19 Field Regiment, Royal Artillery, in the Andersonstown district, to the First Battalion, the Argyll and Sutherland Highlanders, based at Bedford Park, and the Newry-Comanagh border area, and as mentioned in the Military Wing, Mass grave Park Hospital, Belfast.

Shankill Regiments: Five are detached

1. About 0800 on September 5, a bomb — estimated to contain 20 lbs of high explosive

was thrown from a passing car into a house in Cedar Avenue, Shankill.

Within minutes the British armoured ambulance attached to 40 Commando Royal Marines, manned by a driver from the Royal Corps of Transport, a PORRA, and the Medical Officer was at the scene — one of considerable doubtless with broken glass, masonry and timber and the usual smell of explosives, with big holes in the house remaining. Casualties from the adjoining area detached dwellings were treated for shock, cuts and minor injuries and three were taken to the Royal Victoria Hospital where the staff are highly experienced in the management of such cases. Whilst engaged in transporting the injured to RVM, the Services was recalled to the 'incident' as one person was still moving, after slipping amongst the debris, a female was found with multiple fractures and evidence of fatal wounds, again.

2. On September 6, a detachment from the Prince of Wales Own Regiment of Yorkshire was ordered to wear a VEM, parade in East Belfast, in order to provide an immediate deterrent to acts of violence involving cars. A number of vehicles in cluding a British ambulance left Palace Barracks, Hollywood at 0700 and remained

relatively inconspicuous — at 0800, riotous in the vicinity of a station where the parade took place.

During the course of a long and tedious day a soldier was seriously injured by a projectile wound in the back, apart from this,

no serious incident occurred though the boredom and discomfort from remaining cooped up in a Service car 18 hours, with a short break for a stand-up meal in a recently finished car factory, was perhaps not the ideal way of spending a Saturday. There is a constant feeling of considerable tension on these occasions as a jeep driver's helio is always liable for maintenance and a relatively powerful search lighted detector can spot you another incident — so the quickly reported in the press and television news bulletins.

3. On October 2 while serving with the Agglil and Sutherland Highlanders, based at their headquarters Bushbrook Hill near Ninew a PEO armoured vehicle was shot through the windscreen by a high velocity bullet and consequently overturned into a ditch beside a country lane near the border. Within 10 minutes a Scout helicopter with the Army Air Corps pilot had landed me at the incident where four casualties were reported. The injuries sustained included fractures of the skull requiring craniotomy on entry to the hospital, a Pott's fracture and a fracture of the femur. After first aid measures were completed, the casualties were first evacuated to the Medical Centre Bushbrook Hill and two were subsequently evacuated to Murgrove Park Military Hospital.

Immediately following this shooting the medical officer was reported at Ninew to examine two suspects captured by the Security Forces in connection with the case. Local regulations in N Ireland ensured that a medical examination was carried out before and after questioning by the Army authorities, whatever the hour of day or night — a situation which could become acute when the numbers involved reached 20 or 25.

During this procedure one of the suspects had an attack of generalised tonic and clonic convulsions and necessitated admission to the local hospital.

Meanwhile another casualty had arrived at headquarters from an outlying district near to Crossmaglen being flown by helio despite an absence of possible means and bulky cargo in the lanes.

The immediate care of the injured in the border district was inevitably on the safe side of the medical officer as there is only space for one passenger in the Scout helio except for doctor's progress on landing usually means helping over bushes or across hedges in order to reach the ambulance so that the degree of mobility with his first aid equipment, was vitally important.

4. At the Military Wing Murgrove Park Hospital routine procedures for management of casualties were carried out by the anaesthetist including intubation prior to those requiring respiration. A trial of the drug alfentanil or CT 1481 manufactured by Glaxo was carried out with somewhat variable and inconsistent results. Alfentanil is an intermediate short acting agent, which is not stored in the tissues and is rapidly metabolised by the liver. There is rapid recovery but frequent muscular excitation during induction however is related more to the severely shocked and unresponsive than the Surgeons of the Agglil and Sutherland Highlanders, which was blown up by a 200 lb land mine near Crossmaglen the drug was of value. The number of beds available at the Military Hospital had been increased from 44 to over 100 by September 1970 and the staff complement by a full complement.

The death statistics for Service personnel were as follows: 1970: 8 1971: 41 1972: 121.

During 1972 the monthly figures were: January: 4 February: 7 March: 9 April: 10 May: 11 June: 22 July: 19 August: 26 September: 11.

Reference in the special article by R. S. Knight in the *Lancet* dated July 1 1972 concerning the reception and resuscitation of casualties in South Vietnam is of great

maroon, being a description of experience at the First Australian Field Hospital. Dr Knight was previously an aviator in the Royal Navy.

Discussion

A. Transport

1 **Sea King helicopter**—this was excellent for rapid movement in the Border areas, where the coastal base was constantly subject to land mines and booby traps. Only one patient was recovered — on a stretcher outside the cockpit, with the consequent grave disadvantages of exposure and lack of ventilation and constant surveillance.

2 **Whale helicopter**—the method of descent for evacuation of casualties from the Border had there was an excessive delay due to local circumstances in the helicopter had to be called up from the Royal Air Force base at Aldergrove, Belfast.

3 **Boeing unarmoured ambulance** is an excellent vehicle, proof against high velocity bullets, but some difficulty arose for patients and potentially dangerous for occupants in the 1970s landmine incident with the Argill and Sutherland High land air, when the passengers were killed from shell injury.

4 **PG armoured ambulance** first wheel off the jet. Hunter Initiative against high velocity bullets.

5 **Long wheelbase Land Rover** (air vision protection). Not bullet proof and considerable difficulty in communicating with driver when medical officer is with patients in rear of vehicle. The most satisfactorily designed vehicle.

B. Equipment

1 **Analogue intravenous priming** of morphine was used most frequently, also an ozone apparatus, while satisfaction of use was particularly for patients suffering from shock after bomb explosions in conjunction and difficult to carry.

2 **Intravenous fluids**. Hartmann's solution (Co. Red-L-acting D7) is preferred in Dantrolene 70 firstly because heated for cross matching is not required prior to administration and secondly it is available in plastic bags which cannot shatter in helicopters, or armoured vehicles.

3 **Resuscitation**—the Laerdal/Waters/Pedagon modelers is best, about a one section in the into an endotracheal tube is now provided with the set, though a plastic Cudd's connector for a size 8 or 9 tube is perfectly satisfactory.

The Pedron plastic laryngoscope is satisfactory.

The best operated suction pump can be worked using hand pressure, if both of these require this alternative an electrically operated pump would of course be preferable.

The plastic inflatable splints proved to be valuable. A detailed list of the individual stores of drugs and equipment is made by each medical officer, it is worth remembering that an intravenous infusion set may be used as a first aid alternative to underwater drainage in case of chest injury.

Conclusions

The medical situation regarding treatment of casualties in Northern Ireland is described and some detail of transport and equipment is noted. The ideal ambulance for such an emergency is not at present available.

A number of life saving procedures which may be carried out by the medical officer include:

- (a) ensuring a clear airway by intubation if necessary
- (b) immediate control of haemorrhage
- (c) availability of analgesia
- (d) replacement of fluids intravenously
- (e) prevention of wound infection by skilled application of a sterile dress

ing, so that it stays in place without rupturing the wound.

- (b) splinting of fractures,
- (c) care and assessment of serious lung injuries by means of pneumothorax and ensuring that the hole is airtight in the case of sucking wounds of the chest.

Finally, I was frequently amazed at the guidance shown by Commanding Officers, Service personnel, and civilians for the protection of the medical officer specially

brought to the scene of an emergency. I suspect the person policy of a doctor being attached to each battalion is somewhat overstated. In AD 100 *Scoutman* wrote: 'Private Hunt? His advice remains sound.'

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CASUALTY CARE IN NORTHERN IRELAND

By M. P. Goodham

Introduction

The situation in Northern Ireland, being one of internal security, presents problems unlike those of any previous campaign. The enemy both the same speak the same language and use identical firearms. The low profile, peering side of the British Forces make them an ideal target for urban guerrilla hit and run tactics and the situation provides problems which challenge medical facilities to the full.

40 Commando, Royal Marines, went to Belfast in June 1972 to secure the civil authorities to maintain law and order in a psychologically disturbed and disrupted society. The unit suffered its first casualty on July 26, 1972, and three months later had had two deaths, 37 other gunshot wounds and 32 blast injuries treated in hospital.

During a similar period the same Army bases had suffered 35 dead and 142 wounded as a result of gunshot wounds with 22 dead from blast injuries of 31 more admitted to hospital.

Mortality and injuries can be exceeded but the psychological morbidity to the Forces and the population will never be assessed.

This paper outlines the injuries sustained by 40 Commando, the treatment given and the facilities available.

Injuries and Case Histories

The proportion of gunshot wounds to other injuries has increased during the campaign. Over a three month period in the summer and autumn of 1968, the Royal Victoria Hospital, Belfast, treated 77 bullet wounds out of a total of 383 injured while

the 1972 figures show a preponderance of bullet wounds.

The anatomical location of lesions in 40 Commando casualties showed that of 17 wounds sustained by high velocity bullets four were to the head and neck, two in the chest area to the abdomen, two to the arm and eight to the lower limbs. These figures are disproportionate to the surface areas exposed and both headshots and chest injuries.

Case Histories

Case No. 1. A 24-year-old marine shot in the left side of the chest with a pressure injury wound below the left nipple and an exit wound below the left shoulder. His lung collapse was present clinically but the pneumo was confirmed, bronchial and shocked. There was a blood loss of 1 to 1 pint from the lower wound and an exit one centimetre in the thorax.

Emergency treatment was by an IV infusion of dextrose 5% and sodium citrate and oxygen (50/50) mixture. The chest improved but cyanosis was still present on arrival at the Casualty Centre where the patient was given 100 per cent oxygen and Phenyepene 10 mg IV. Chest X-ray showed minimal air in the left base and subcutaneous in the right base. An aspiration of the entry and exit wounds were removed and treated. Tracheostomy with controlled ventilation was required 12 hours after admission as pulmonary oedema had developed and the patient was comatose and semi-conscious. This was continued for four days. Thereafter the patient had a steady recovery during which bilateral subcutaneous and chest aspiration required treatment.

Case No 2: A 14-year-old male came into the hall with cuts, and cut wounds on either side of the neck (Fig. 1) before the cervical cartilage. There was heavy bleeding but no immediate respiratory distress, and no pulse shock.

As IV infusions of dextrose 5% and oxygen were given and the patient reassured, his state of consciousness improved. His state of consciousness improved and a rapid return to normal and repair of the left submandibular gland, strap muscles and surrounding structures were undertaken.

Recovery was successful but there was damage to the cervical branch of the larynx nerve.

Case No 3: A 14-year-old male came into the hall with a small injury around the right lower mandibular jaw and no visible cut wound. The patient was calm and in pain and pale but not shocked or cyanosed. The abdomen was tender but there were no abnormal signs in the respiratory system. Physiotherapy treatment was by 10

IV infusions of dextrose 5% and oxygen (50/50) during resuscitation. X-ray showed a bullet present in the left lung (Fig. 2) and there were signs of abdominal bleeding. The bullet had probably been deflected as there was a fracture of the body of L3 vertebra.

An exploratory right thoracotomy showed blood in the right pleural cavity and a bullet wound in the chest of the right lung. Laparotomy showed a laceration through the upper anterior aspect of the liver. Left thoracotomy showed a bullet hole in the lower ventral of the lung with a bullet present in its substance. Pleural cavity was packed around the lower part of the pneumothorax.

The patient made a remarkably successful recovery and was discharged after one week to his residence.



Fig. 1



Fig. 2. The bullet in the right lung, in situ.

Case No 1. A 36-year-old man, shot in the right thigh with small entry, and exit wounds 16 inches (41 cm) apart on the posterior lateral and anterior aspects. There was no evidence of loss of blood externally but evidence of fracture of the femur.

Emergency treatment was by splintage. IV infusion of dextrose 70 and 180 mg penicillin. The patient was kept prone one pint of blood and 5 days confirmed a non-extended fracture of the mid-shaft of the right femur.

An operation both wounds were debrided and dressed, a Bierman's pin was inserted and Thomas splint traction set up.

A good post-operative recovery was made and the patient was fit for transfer after two weeks.

Case No 2. A 32-year-old man with a fracture of the right mandible caused by the same bullet which had inflicted a fatal head injury on another casualty. The patient appeared 24 hours after the incident, in stable compensation state. X-ray identified a minor fracture of the lower border of the right mandible. No treatment was required except prophylactic antibiotics.

Case No 3. A 24-year-old man shot in the right popliteal fossa with a 1" diameter entry wound in the lower part of biceps femoris just above the insertion of the lateral head of gastrocnemius but no exit wound. Anterior and posterior tibial artery pulsation was absent. Distal leg of blood appeared to be stopped by the wall and thigh was swelling rapidly. His general condition was rapidly good. An emergency treatment on inflatable leg splint was applied penicillin 180 mg was given and sodium citrate and copper (20/30) given. An IV infusion of dextrose 70 was started during consciousness. X-ray showed the bullet in the popliteal region (Fig 2).

An operation, a 1" defect in the popliteal artery and damage to the vein and the medial popliteal nerve was done. A vein graft was performed and had to be re-

joined six hours later because of low Q blood pulsation.

Recovery was complicated by the next injury and posturing infection.

Case No 4. A 22-year-old man shot in the left upper thigh with a high velocity bullet, wounding a small artery, wound posteriorly and an 8" (21" wound involving various femoral vessels laterals and sartorius with artery lacerated and venous bleeding. There was no apparent fracture of the femur. The patient was initially in a state of mild hypotension, semi-conscious with a weak pulse at 140 beats per minute.

Emergency treatment was by packing the wound with dressings under local anaesthesia. One liter of dextrose 70 was given with sodium citrate and copper 30 per cent during conscious periods and oxygen 100 per cent during fits of consciousness, while resuscitation was carried out. On admission the further treatment a second cut-down, deep was suggested for rapid infusion of Q leg blood. The condition of the patient improved rapidly following this with blood pressure rising from 80/60 on admission to 100/100 after 15 minutes when arterial bleeding recommenced. When the patient was unconscious and semiconscious, penicillin was given and he was moved to the operating theatre.

An operation spheno-venous grafts were used to replace these vessels of femoral artery and vein. Gluteal muscles were exposed and the wound loosely closed. A total of 12 pints of blood were transfused despite which the BP fell at 40 hours to 100/60 per mm.

A slow recovery was complicated by wound infection.

Discussion

1. Blood Flow

One of the reasons of emergency treatment is to stoppage and arrest blood loss but this can be excessive and it may be better to treat according to the pattern of

circulation described by Grant and Ryer (1981) who state that patients suffering from cold hypotension require immediate IV infusions (Cases 1 and 7) while those in better condition, although not in need of immediate resuscitation, will require later replacement therapy for blood loss (Cases 2, 3, 4 and 5).

The majority of trauma patients will eventually require operation and the sooner it is possible to initiate resuscitation and IV infusions, the less time is wasted later before further investigation and surgery can be carried out.

2. *Armed blast injuries*

Only 18 cases were treated. This is because the civilian ambulance service is essential and only in exceptional circumstances are we able to manage head bleed or air-bombly cases as they tend to cope and request Service medical aid. Of these 18 cases, only two required resuscitation for multiple injuries. The seriousness of head bleed injuries in the Armed Forces can be assessed from the figures in the introduction to this paper.

3. *Riot situations*

In 1985 Balfour (1985) summarised the injuries of 345 patients from riot situations. These data were interesting as they have not been reflected by the newspapers of the Armed Forces and Police who now face both sides. There have changed the conventional weapons are now stones, milk bottles, bricks and gas, rather than petrol bombs having largely given way to the tear bomb. The Armed Forces have been using rubber bullets which have rarely caused mortality. The new plastic balls have yet to have serious trials.

Armed Forces casualties may live in riot situations because of staffless drill and discipline. Civilian casualties very seldom get to the intensity of the riot.

4. *Medical Staff of RM Commands*

Task Company has one Medical Agent

and also is normally carried with the Company Commander in his Land Rover Group and in therefore able to reach the site of the accident rapidly and commence first aid.

The Regimental Aid Post is manned by the Medical Officer, the Petty Officer Medical Assistant and one Medical Agent and dressed and situated. It is situated as centrally as possible.

5. *Casualty Evacuation*

Because of the speed of evacuation and the need to start immediate resuscitation, the Medical Officer and Petty Officer Medical Assistant travel in the back of the ambulance. Rapid assessment and removal of the patient on a stretcher is essential both for the patient and for the safety of the medical staff. The only indications for removing several patients in the ground are to stabilise the patient and to apply tourniquet limbs.

6. *Equipment*

1. *The Service Armoured Ambulance*

This is a six wheeled badge patrol vehicle which is suitable for urban use and is generally in traffic. For three reasons, even out of the back gate, suitable to the long wheelbase Land Rover Ambulance is offered. This has the drawback of the movement of the patient, delay and expense of the medical team.

2. *The 192 Armoured Ambulance (1 wheeled, 1 ton, Marder)* An excellent vehicle. Its drawbacks are its height for loading a stretcher into the rear and the very limited headroom which makes gravity drops ineffective and intravenous pump action infusion sets or a Marder pump.

3. *Long Wheelbase Land Rover (armoured) protocols*. This is an excellent vehicle in general but there is some difficulty in loading stretchers, inadequate access behind the patient's head for intubation and difficulty in communication with the driver.

The ideal Service ambulance for use in where medical activity during has not yet been developed. Its essential features should be:

- a) ease of transfer of patients from coast to ambulance, this should best be managed by a wheeled stretcher
- b) Good headroom in mobile vehicle head of pressure for umbilics
- c) Storage racks for drugs, instruments and other necessary equipment
- d) An electrically operated suction apparatus
- e) Good access to the head of the patient
- f) manoeuvrability in traffic
- g) Patient privacy. This cannot law be provided in vehicles, are rarely attached unless the occupants are suitable

Sophisticated mobile equipment has been developed for the British Racing and Sports Car Club and it should be possible to provide similar facilities for use by the Armed Forces

7. Equipment

All ambulances in the Unit carry the following equipment:

- a) Extensive apparatus. A mixture of 50 per cent oxygen mask and 40 per cent oxygen which is extremely valuable for:
 - i) Administration on the ground to an injured patient in the first stage of resuscitation prior to removal to the ambulance. This capacity does not get well utilised
 - ii) Self-administration in the ambulance while other resuscitative measures are proceeding
 - iii) Administration to 'shell-shocked' bomb blast, hysterical women. Oxygen about has been found to

be useful in this situation as a pre-vascular reflex

- b) Ambulance (Aids) During 70 in operation is 64 per cent volume chloride is used in the emergency situation in the treatment of other IV fluids although there are the following disadvantages:

- i) It is prepared in a glass bottle which on occasion shatters
- ii) It requires the taking of blood for cross matching prior to administration. This problem has been partially overcome by the use of numerous mixtures which permit the taking of samples

The advantages of Distress are:

- i) The majority of the fluid remains in the container and it is a great relief
- ii) It does not carry the risk of transmitting hepatitis
- iii) It prevents contamination, preparation which are of use in the preservation of amputations
- iv) IV Infusion Sets. Some sets are not adequately packaged. The main container rapidly breaks apart and the sterility of the fluid path must be open to question

Distress DR2 sets are used as they can be pumped to various IV lines. This is necessary because a gravity head at pressure cannot be obtained in the rear of the vehicle as present in the

An infusion bottle of Distress 70 or 80 per cent volume chloride is set up and run through a Distress DR blood administration set under vacuum conditions and the set hung in the vehicle. The end of the administration set is submerged in concentrated fluid to maintain airway. This method serves up in five minutes at the

time of the injury and also ensure that the set is put together under sterile conditions. Disadvantages are the weight of equipment, which is changed weekly or earlier if any leak, air, or tears, and the possibility of an occluding catheter.

③ Hot blood is used extensively in the casualty departments of the hospitals but it would not be possible to store this in vehicles and Lindehan (1965) points out that it is only indicated in cases of cold hypothermia or estimated loss exceeding 50 per cent.

4. Resuscitation Appliances

i. *The Luerlock / Fickler / Forester Mechanism* This has supplied all the resuscitation equipment required and is superior to the 'Ambu Bag' as it comes in a strong carrying case, 45-65 per cent oxygen can be supplied by using a reservoir (size and capacity (children's and adult face pieces and sensors) are included).

ii. *Portage oxygen valve* This has been adapted for use with the portable Venturi Mask and has been useful in several instances.

iii. *Facemask for oxygen gas* This is adequate though a small change and with Magill oxygen and medical tubes, oxygen change

can be made but would be useful and more easily kept clean.

iv. *First aid oxygen pump* This is the possible use both in the vehicles of the general ambulances and on doctor's operated unit as required.

5. Future Considerations

Review is required of military medical vehicles and equipment available to modify trained personnel. The old adage that 'if he dies in the first ten minutes he would have died anyway' must be abandoned. Discussion to hospital, refers to team five minutes per mile and the setting up of a drug and infusion of 1 hour takes 10-15 minutes while moving. Early and adequate resuscitation can greatly reduce mortality and morbidity.

Acknowledgements

Acknowledgements are due to POMC, W. J. Davis and B. F. Page, 40 Commando RM Medical Staff, Royal Victoria Hospital, Canadian and Norway Staff and Mangrove Park Hospital Staff.

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AN OUTBREAK OF DENGUE-TYPE FEVER AMONG ROYAL MARINES IN SARAH — 1964

By Ronald G. Wilson, formerly MD 48 Cdn RMP*

Areas where the vector *Aedes aegypti* and possibly *Aedes albopictus* (Skusek and Chan 1965) are to be found may have endemic dengue fever (15 per cent of the population of Sarawak suffer from dengue annually). The increased speed and volume of trade travel have the capacity where dengue may spread for the first time. However outbreaks in other countries have been reported recently (Kilick 1964 and Griffiths 1965) isolated island incidences may be even rarer.

During the Indonesian contribution of 1962 1966 40 Canadian Royal Marines were stationed for six months from July 1964, on a remote part of Borneo (North Borneo). Tawau was the district capital although the majority of the Unit was stationed 40 miles away along the Serudong and Kuching rivers which run parallel to the border with Indonesia. The RMRG with Commando HQ was based at Kuching village.

The rifle company was based in an old Chinese-owned shop and warehouse in Serudong. Last the shopkeepers and the Malay villagers having been moved to the Tawau area six months earlier. The area had been occupied previously by Malaysian and Chinese troops but no European troops had been stationed there; the British desert reconnaissance battery formerly visited the area once a year by launch.

An advance party had been in Serudong for a week before the main unit arrived on July 28. On the 24th a manna from the advance party was recovered by helicopter

to the Unit dock Bay at Kuching sailing from a Porters of Unknown Origin. He complained of a bulging discus pain behind the eyes, which became very severe on eye movements and severe headache. These symptoms were accompanied by a pyrexia of 104 F (this had been as high as 103 F in Serudong) and severely impaired consciousness. I had been the RMO of the Unit for a year and had not encountered a PUO of this nature. It was thought that this was not Weil's disease, which the Unit had experienced in the 1st Division of Sarawak six months previously, and this opinion was confirmed by the absence of albuminuria and jaundice. Malaria slides were negative and there was no fever in chest, but diarrhoea had been a feature in the early stages of his illness.

The symptoms and signs settled after 48 hours with bed rest and analgesics only and he was able to return to light duty with his company in a further two days.

After this first case there was a steady stream of 24 patients daily from Serudong with classic abdominal symptoms and signs. These cases occurred in a chronological order from the date of arrival of the individual manna in the barracks, particularly if they had been away on patrol. Each rifle company headquarters and one troop were stationed in Serudong for one month before being relieved by a fresh company from Kuching and the Serudong company being transferred to Tawau for rest and recuperation. Following the change over there would be a period of two days with no fresh cases in Serudong but a small number would develop in Tawau. There

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TABLE II

Agent No.	Dosage 1	Chloral Doseage	Dosage 2	Terminal
100-47	20	+	40	20
100-48	20	+	40	20
100-49	20	+	40	20
100-50	20	+	40	20
100-51	20	+	40	20
100-52	20	+	40	20
100-53	20	+	40	20
100-54	20	+	40	20
100-55	20	+	40	20
100-56	20	+	40	20
100-57	20	+	40	20
100-58	20	+	40	20
100-59	20	+	40	20
100-60	20	+	40	20
100-61	20	+	40	20
100-62	20	+	40	20
100-63	20	+	40	20
100-64	20	+	40	20
100-65	20	+	40	20
100-66	20	+	40	20
100-67	20	+	40	20
100-68	20	+	40	20
100-69	20	+	40	20
100-70	20	+	40	20
100-71	20	+	40	20
100-72	20	+	40	20
100-73	20	+	40	20
100-74	20	+	40	20
100-75	20	+	40	20
100-76	20	+	40	20

Background of 10 mg with 4 hours of oxygen
will test test pulse from incubation

* Less than 1 mg

extent of the probable vector incense naturally assumed. This was attempted by DDT spraying using a flying jet at three consecutive dumps. At the same time all larvae present at the vicinity of the dumpsite were sprayed. After the end of the second week following spraying no new cases occurred in the units stationed at Serendang for the remaining 21 months of the tour in Burma; not even any reported from 42 Cdo RM which entered 42 Cdo RM on that region for a further six months.

Swelling

Serological confirmation of the clinical diagnosis was attempted in 11 Royal Marines on (incubated against Yellow Fever).

- 1 Confirmation that this was not leptospirosis was denied out by the hospital laboratory in Taiwan.
- 2 Serum from patients was flown from Serendang via Kuala Lumpur to six packed diagnosis containers in the army lab unit at Singapore for serological analysis but this failed as the time of storage was up to one week.
- 3 The US Army research unit in Kuala Lumpur examined the 'incubation' serum of 10 patients remaining in the UAC who had the fever; the samples being taken in June 1965. On the first analysis, haemagglutination for leptospirosis and antimitochondrial swelling

against King, Gillies and King strains of virus typified, classified these virus cases as being the cause of the outbreak.

A more specific analysis for dengue was then carried out (Table II). It is possible that this was an outbreak of dengue type II although not of a classical type, and was of a benign nature due possibly to the absence of other strains of the virus or other arthropod borne viruses which may be contributory to the onset of the severe haemorrhagic fever and shock syndromes occasionally found in endemic dengue areas (Wheeler 1968).

Summary

- 1 In 1961-62 Cila BM was the first European unit to provide a Garrison at Serangoon. Later a remote village at Sicheh (Pichia Boreat)
- 2 180 cases of a mild dengue-type illness occurred only among Marines who were stationed there.
- 3 The epidemic ceased after evacuation of the arthropod population surrounding the village and no further cases were reported up to 15 months later.
- 4 Serological studies (although not epidemiologically sophisticated) suggested that this had been an outbreak of dengue type II fever.
- 5 How the virus was introduced to the Garrison is unknown.

Acknowledgements

I would like to thank Dr W. Turner and the laboratory staff of Tarnet Hospital for their help in examining blood films and sera, and Major G. Rappwood and Dr N. J. Murdoch of the US Army Research Unit based in Kuala Lumpur for their cooperation with the serological studies. I am indebted also to the Fleet Air Arm and Army Air Corps pilots many of whom personally examined blood samples from

forward locations to Tarnet Hospital.

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Editorial comment

This paper will induce a wave of nostalgia in some members of the Service while amongst those who have perhaps had to spend the majority of their time as tropical-area visitors it may be a topic to which what can be done under active Service conditions in the bush.

It is too little realized how common and widely distributed throughout the tropics are such short term fevers, usually due to arthropod borne viruses that often have their reservoir in local animals. Most would seem to be innocuous and few can incite themselves to an unusually mean or arthropod to man cycle. Not only is the epidemiological situation variable, particularly where a virgin population such as foreign troops are introduced on the scene but the viruses themselves are often, if not one prides from the clinical disease they produce very variable too. Hence when one is faced with such an epidemic as this the best advice is the local general practice doctor is failing him the local medical specialist or even the village headman. Sometimes in this tropical world of the process of medicine the doctor may defy the flesh of man and borrow the game of experience from nature.

The author is to be applauded for having done just this and having continued to ask himself to his valuable questions even in these difficult circumstances. The evidence collected certainly points to a dengue like short term fever possibly Dengue II or III. The author concludes with the question implied in the statement: How the virus

was introduced to the lecture's unknown? Having already acted as a wren biologist by interrupting the mode of transmission of the infection he had achieved his purpose and averted the epidemic. Almost certainly he was busy enough in this wren-borne situation and what follows is not in any sense a criticism but the next lecture noted for an applied biologist is to have spread a net and watch the cat go down. It does not take long in these lectures. The darkness comes first over the scrub or marks at his feet where small mammals scurry amongst the dead leaves and for a short moment the cat's eyes illuminate the flying arthropods sharply against the darker ground. Soon only the higher leaves trees are lit where the parakeets and doves are making their final notes before sleep. Then, in the last light, a crimson flame and gold wash against an indigo sky of rapidly

deepening tone. The silhouette of the flying loons or frigate bats are seen winging down from their higher ground to feast upon the lower insects. Despite 18 centuries have been demonstrated in many observed or made simulated birds and even in flying loons (Kruess and O'Connor 1967) to say nothing of the monkey who creeps down from the trees under cover of darkness to eat when these other monkeys without tails are busy on the ground. Monkeys have their preference, in looking but after all a blood meal from a Royal Marine now is worth two bites from a monkey's nose. The moral is that the biology of man is only part of the biology of the environment in which he lives where, when it may be.

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MARINES AND CANOES

C. W. Evans

Earlier attempts and an ever growing mound of crumpled paper have convinced me that writing about the Marines, particularly for the Royal Naval Medical Service, is an extremely difficult undertaking. We seem to be regarded with great interest and suspicion by our Naval colleagues and we are subjected to streams of rather persistent banter about boats, heavy weights and intelligence. The Commando Medical Officer and his team are much maligned. We seem to get the maximum out of our young men by physical endurance and, barely enough, although we work as a team, much of our medical achievement stems from our work as individuals. It is a joyous ambition to be fit one minute. The Corps is the place for him. He will be rewarded on all manner of subjects and once he has passed his test a confidence in his boats are low. The Royal Marines tend to welcome character, so concentration on our limited use has rather welcomed as a happy deliverance from what most people would regard as anything but a hazardous existence.

All personnel serving with the Marines are expected to do the Commando Course at Lympstone. For some reason the course has acquired a reputation throughout the medical branch of the Navy rather like climbing the North Face of the Eiger. The course is designed to train people to look after themselves when living under opera-

tional conditions and placed in circumstances intended to be, in the best of the world, extreme.

The aim is to pass people, not to fail them. The majority of recruits are aged about 17 when they do the course, not very old and not very strong. They manage to pass and a slightly older man should do so easily. The course lasts three weeks. Attached personnel can pass a two week introductory course beforehand, familiarly called a boot up, when they learn about their rifles and equipment and do some fitness training. The candidate learns many things. An interesting discovery is that a rifle and a pair of boots are now your best friends — rather hard on your wife or girlfriend. Commando is a great virtue, particularly pointed on a day in which the candidate has planned personal movements to stand for the whole today. The last week of the course is mainly concerned with four timed tests. A six mile march in one hour along roads. The Taffia course, which is a collection of ropes on trees and on granite courses, for which 14 minutes are allowed. The Endurance course is an obstacle course of pools, hills and trenches followed by a short run and the last test is a 20 mile walk across Dartmoor. In the good old days of 1947 it was 20 miles across the moor and the speed march was more tests.

At the end of the course which most people enjoy, if only as a respite and is awarded a Green Beret. This is a remarkably poor of lot, probably necessary to prove cold and frozen though I must admit that it has not always been wholly effective in my case.

After the course, a medical officer or student candidate is likely to go to a Com-

Editor's Note: Captain C. W. Evans has served with the Marines for five years mainly in the Army and the first test, an 8000 foot run in four hours, over Dartmoor and Malin, he passed successfully from 1962 to 1970, repeated the latter test and was successful once it national and international level.

months' leave, but I was able to go to India when landing risk and passenger concern working is done, and there are great opportunities for sporting sport.

From Pondicherry I went via the Royal Army Medical College, Netball, where I learned a little tropical medicine in its Clinic in Singapore. The course at Netball was very valuable, interesting and well run. Colonially doctors can learn much from the R.A.M.C. and the R.A.M.C. can learn so much too. There should continue to be a very close liaison between the R.A.M.C. and the Naval Medical Service. I was more able to see something of the Far East. By staying at the major ports, Bombay and Madras, we were able to leave the Companies and set off into the jungle in Burma, the Philippines and Malaya in a Land Rover armed with a machine and medical kit. This was great fun for the medical officer and I think for the rest of the team, giving them a chance to meet people, not something of how they lived and perhaps specially, to eat some of their food. I am very doubtful of the benefits to the local population of a one man clinic. I am very sure a doctor can do valuable work in these conditions but feel that with no follow up the doctor is of little use.

In my limited experience in the West Indies, Africa and the Far East, the greatest benefit to the health of a community would seem to come from simple Public Health measures. Much parasitic disease and also such diseases as cholera, typhoid and some others can be controlled by the provision of a safe water supply and working latrines. Latrines are usually to be very popular or appreciated even because they deprive the farmer of his only fertilizer. A properly built well will last and will be maintained. It may be some good *Antibiotics*, antibiotics and vitamin pills are soon forgotten.

Working together, the doctor and the engineer can be of tremendous help to the

people of developing countries.

Later I went to a tropical zone, that is East Africa, mainly at Mbitopo Hospital, Kampala, Uganda. Uganda in 1911 was a rather unbroken and unbroken country.

Mbitopo Hospital was built by the British as a present for the independence of Uganda. Originally designed to hold 400 patients, parts of the old hospital have been expanded so that there are now 1,400 patients. The Medical School should soon produce 100 graduates a year.

Most of my hospital time was spent in the Medical Wards which were crowded, unheated and not very clean. Many patients had to sleep on the floor, children often had to be attended with their mothers and relatives coming along to look after the patients' food needs.

Patients' dirty, working medical notes and their charts, in well advanced and the physical signs are usually gross and unmistakable as a result. Frequently the Ward Doctor will have been consulted earlier and the notes of his successor can give some guide to the direction of the disease. Diagnosis is more often than not complicated by the presence of multiple pathology and the very poor history that is obtained partly due to language problems, and partly due to the poor memory of patients.

Chronic heart disease is common and frequently affects two or more valves. Usually I could not distinguish this from rheumatic heart disease which is common in Uganda. I saw no gross lesions or valvular heart disease — perhaps, years had postponed them. Patients tended to suffer in advanced congestive failure. Many were poorly nourished due to dietary deficiency, lack of exercise and repeated pregnancy. It was remarkable how some of these patients responded to correction of the anaemia but disappointing to reflect that once back in home they would again become infected with hookworm and

malaries and he, like so medical men, and they returned in advanced stages again.

Both chronic heart disease and nephritis are thought to be caused by viruses (even growing in the tropical areas which are fatal in most children). Nephritis may also be caused by an autoimmune response following quartan malaria. Tuberculosis is very common. There is a lowered resistance to pregnancy and it was usual to see an undernourished mother who had been infected with fever, coming for relief in the ward. The deaths caused with modern appliances, penicillin and a poor supply of milk cannot have been good.

Malaria is a serious disease amongst African children. Vaccine is available but is too expensive for general use. Typhoid is said to be a common cause of fever and was often diagnosed but now upon us hard to find on a dark disc and the laboratory could not always confirm the diagnosis. Schistosomiasis is common. The coal and mining mines and rivers abound with organisms yet I saw no cases in the hospital on the whole of the enlarged rivers and our patients' cases were due to this. The diagnosis is in fact rather academic because like all people live by taking and so are bound to be infected. It is a public health problem which could be attacked by good drainage treatment. The hospital staff however still happily on the infected Lake Victoria.

Malaria remains the commonest disease and must be the greatest killer in the area, particularly in the six months to five years age group. Malaria (acute and periodic) outbreaks have resulted in more than children being exposed to the disease than ever before. Malaria has to be considered in every case of lower gastro-intestinal disorders or coma. Of necessity the staff at Malaga are much more run down than doctors in UK. Observing the huge and growing piles of translucent sandpiper meat and unnecessary antibiotics handed

out in the country gives one some long thing to learn.

In the special case attached to Malaga I was able to see a few of the natives. Bush above Darkest Impotence and Kapon's anatomy.

Developing is the mode of all the disease on a continuous diet of black (plantain) and beans with local diseases: the average African is a strong splendidly built specimen, joining the Europeans among them to share. Natural selection has served them well though it is given now to assist him and parental greed. I think it is right to interfere to control malaria, multiple leprosy, yaws, parasites and other diseases, but let us hope that those concerned think first of adequate food and birth control.

There are several Medical Research Council sponsored teams working in Malaga and I was able to travel around with the Malaria Unit which is working on leishmaniasis and child manson, and also with the Rural User Team which is investigating the spread of encephalitis, ulcers in Uganda, and conducting a trial on the treatment of bush above.

I was able to visit all the Uganda Game Parks and later some of the Kenyan parks as well. It is interesting that the Uganda parks exist because at an epidemic of sleeping sickness about 1918 to 1919 as a desperate last effort to control the disease, the remaining population was removed from the infected areas and the ungazetted land had but some because the Game Parks I only saw one case the which added on my visit at Fortis, but the leishmaniasis that has delayed the production of this article has some of the features of leishmaniasis.

I am very grateful to the Medical Director General (Nairobi) for allowing me to visit East Africa. The experience was of great value when I came to take the Diploma in Tropical Medicine and Hygiene. The Royal Marine being where wherever

by map by hand was/were unreliable, in the north to the sticky heat of the jungle or south were exposed to disease for a frostbite in Norway or malaria in the tropics, then the displaced Navy. Add usually the moving map have arrived by air only hours before and be unacknowledged. At present we have a large number of officers and NCOs with experience of being or chosen from the tropics to the Arctic. Now that we have experience from the Far East, the knowledge of life in the tropics must be lost and is, some important. Should we have to return to defend Malaya in the future we will have much to reflect.

It seems to me that it is really important to retain some knowledge of life in the tropics. There is no substitute for it, parents in this, and it is the men who lead the parents who need the experience — young officers and NCOs. Perhaps it is difficult to retain a number of experienced men, so those should have better training and encouragement to keep them made to move almost without ill health. The medical officer in the tropical person to be responsible for that and I feel that in future as many as possible should be encouraged to attend a course leading to the DTM&ST.

However, life in the Royal Navy does not entirely consist of capitalisms, travel and medicine, and I have been asked to say something about my training as personnel.

I had been training internationally with some success from 1963 to 1968 and 1970 should. I left for my last year of top class training. I was fortunate in being in Poole with excellent training water on the coast and in finding Corporal Allan Williams who was very kind, very strong, very fit, and could get the time off to train.

We started paddling together in September 1968 and by the end of October were moving quite well. We even won an important race. Training of a military



Fig. 1. Some of the crew of the *Porpoise* (left) and *Porpoise* (right) during the 1968-69 season. (The *Porpoise* was the first of the *Porpoise* class.)

type suffered with paddling through the water, and we were not able to paddle together regularly until mid April. We were not a good crew initially. Cpl Allan Williams had very little racing experience and I was rather slow to adapt to a double canoe after 18 years racing singles. For a while our early races did not go well but in the first three National Long Distance Races when the sailors were watching we gained a 2nd, a 3rd and a 4th on our home water in Poole at the last race. We had left things a bit late but were selected to race in Spain with the British Team. Between October in Spain and the start in August we covered many miles in training and began to move fast. In Spain we were 3rd in the main race out of 222 boats from 18 countries, and on the rest of the time we won 10th, 11th, 12th, 13th, 14th, 15th and 16th. In addition to individual trophies on the various races the British had won the team prize in three races. However, ranked fourth in the back of the eye all the way home.

Back in England we took in the British Open International Championships held on the Tye. We were beaten in two weeks, over 14 miles by the Danish crew but in first British crew we had won the National Championships in a consolation race.

learned to race in Dublin at the Irish International the following week we discussed having challenged our boat and making to be at our best for the much more challenging and important British International the week after. The race is over 77 miles of water and ideas I had raced in both 1968 and 1969 and knew the course pretty well. The weather had been awful in the two previous years with high winds and very rough water in the big lakes.

1970 was a big better but a great change from Spain. We managed to beat the Irish by 1 minute and 34 seconds, having taken 8 hours 22:44 for the race. Although we wanted we had defeated the Irish, who had beaten us in Spain and in England. We were at the top, and it was a good time to retire.

We travelled down to Scotland for the Inver-Servica Championships. Corporal Allan Williams and I won all the individual open and long distance events between us but many of the Navy's other paddlers had been unable to come and we were delayed by the Army. Noella's match of the evening was the 1 000 metre K1 (kayak) single event in which I managed to beat Allan Williams. The latter is a paddler of great potential. He narrowly missed selection for the Munich Olympics, but I got past him to race at Montreal in 1976.

At present I am hard at work building the canoe in which a small expedition is planning to paddle from Singapore to Australia in the Spring of 1974. After that I am wondering how I can justify a longer period in Africa and whether MEDCO will back handle upon an expedition to the Congo (Zaire) in 1974-5.

LARYNGEAL TRAUMA

By Peter W. Hest

It is often stated that laryngeal injury are cases of laryngeal trauma. However as the result of high speed road accidents laryngeal injuries are becoming more common, and all modernists agree on the need for early recognition and treatment of such trauma. Open injuries caused by glass knives knives etc. are well evident and are treated appropriately as is the closed injury due to a blunt compression eg. hit or car steering wheel which may cause undiagnosed especially in the presence of other multiple injuries. The shape of the neck and mandible normally provide protection for the larynx as does the lateral mobility of the laryngeal skeleton. The cartilaginous framework provides further protection as the soft tissues within. When this framework is breached then soft tissue injury may be accompanied by its close attachment to the cartilages. The larynx also prevents much of the swelling and oedema from extending outwards leading to early compression of the upper airway.

Closed laryngeal injuries following road accidents are not reduced by lap seat belts when with sudden restraint of forward movement the potential mobility is thrown forward with the neck hyperextended tearing the larynx impaled from injury by dislocated or steering wheel. With blunt injury the thyroid prominence may be flattened and cervical emphysema present — not obvious signs unless specifically looked for. In a unconscious patient it is unlikely that any form of laryngoscopy would be carried out although it such an examination evidence of cord displacement and other laryngeal damage might be readily apparent. A patient with multiple injuries

might well have needed a tracheostomy as part of emergency treatment. The need to deny the presence of laryngeal injury the latter still becoming apparent quite obvious signs took place. The importance of early treatment of laryngeal injury until its removal is an effort to obtain satisfactory functional results in the long term.

Open (1970) MacDonald (1971) stated that definitive laryngeal repair must be waiting till within a maximum of eight days after injury. It is with this need for early diagnosis and treatment in mind that the following case history is submitted.

A 24 year old female riding was admitted to another grade in November 1976 following an RTA. Briefly her condition was as follows:

1. Emergency tracheostomy (on arrival) in situ for three weeks
2. Pneumothorax bilateral — drainage tubes removed one week later
3. Fractured left mandible — wired for six weeks
4. Fractured left humer — traction walking rig 10 weeks later
5. Ulceration by three days

Until the tracheostomy was placed in clear laryngeal injury was not suspected complete aphonia was noted on admission story chronic.

She was discharged home six weeks after RTA to return one week later for an elective tracheostomy, removal of granulation tissue on the right side of the posterior pharyngeal wall just behind and above the right arytenoid and a laryngotomy with insertion of a Tensilon laryngotomy band between the vocal chords was carried out

On April 21, subsequent progress was delayed by two persistent masses on the right side of the neck, one of which two pieces of glass and a long, thin, metallic stick were removed along the line of the main track. However, the main tracks persisted. For two months he was treated conservatively, but the main tracks then became infected with *Staphylococcus hemolyticus*. At this stage (June 1971) he was transferred to the Royal Naval Hospital, Haslar. He could only manage a whisper. X-rays performed in RNH Haslar on 9-6-71 revealed the following — Hyoid: No bony injury demonstrated on these films, although the body of the bone may have been injured. Base: none — 9-6-71 — "The lateral mass was shown to communicate directly with the right peristyle forus. Incompleteness of the ventral mass showed a track extending up to the body of the hyoid and thence down wards, and on the right to link with the other mass in the region of the right peristyle forus (Fig. 1).

On June 16, 1971, under general anaesthesia the masses were explored and direct laryngoscopy carried out. The epiglottis appeared grossly distorted to the left and fixed with fibrosis. The right vocal cord was fixed and there seemed no normal mobility of the unoperated joint. The

laryngeal inlet was directed to the left and anterior commissure (apparently) to have swung to the hard epiglottis, and surrounding cartilages. Both main tracks appeared to communicate with the right peristyle forus. On probing the central track the hyoid could be felt at the depth of the wound. With the degree of infection present it was felt that there was either pseudomembrane of the epiglottis or ossification of the hyoid bone. The tracks were entered and closed in two layers. The right-sided closure was successful, but the central track required after two weeks. At this stage in view of the important consequences of the hyoid body the opinion of Mr H. J. Shaw, Civil Consultant to the Royal Navy, was obtained. As a result of this on June 1, 1971, a wide exposure of the central track was made through a transverse incision, the body of the hyoid was removed together with the epiglottis — in effect a right, partial partial laryngectomy (Fig. 2). At operation it was found that the track communicated with the laryngeal surface of the base of the epiglottis in addition to the right peristyle forus. In addition to marked chronic inflammatory changes a short length of developing osseous material was removed from the base of the epiglottis. The patient made an unremarkable recovery after operation, and with speech therapy



Fig. 1. X-ray of the hyoid.



Fig. 2. At right: removal of body including the hyoid and epiglottis. The central developing osseous material from a hyoid and epiglottis.

now has a healed but very gross case 108 months after injury. Poor mobility of the renal capsule movement and the patient tends to phosnoe away his waistcoat buttons.

With the patient's severe pastural rigidity it is not surprising that the laryngeal trauma was not detected on admission to hospital. The history itself emphasizes the need to exclude the possibility of such an injury in patients following traffic accidents with multiple injuries. It is not within the scope of this paper to discuss detailed management of laryngeal trauma, but to point out that gross damage can be missed at an initial examination and that for a good functional result intensive study is

early and adequate (Ranger 1971; Wood & Baker 1964).

Acknowledgement

The help provided by Mr H. J. Shaw WHO FRCS of the Royal Marsden Hospital and the Department of Histology RM Hospital Water has been much appreciated.

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LETTERS TO THE EDITOR

Sir

I have the pleasure to refer to your correspondence columns (Vol 52, p 253) wherein a statement made that there is an all round demand for more tropical medicine, a fact that was gleaned from a study of the questionnaire completed by Surgeon Reginald Lamberton on their new entry course.

There is a device which in my opinion should be carefully nurtured and warmly encouraged, with such new recruits, when on arrival of peace we are all compelled by our surgical colleagues that they have had to release the lessons learned the hard way by their predecessors in the Service.

With the decline of the Empire and the shrinking of the Commonwealth, there appears to be only two major sources of medical knowledge available to this country in keeping up our post high standards in the field of tropical medicine and hygiene and those are:

- 1 The Armed Forces Medical Services.
- 2 The two tropical medicine schools of Liverpool and London.

It is up to us in the Navy, Army and Air Forces to keep the torch burning and pass it on to our juniors. But we and they are suddenly called upon for our services and are found wanting.

I am, Sir,

Yours Faithfully

F. E. Wells

Colonel

Assistant Professor of Pathology

Royal Army Medical College

Millbank

Note: The existence of the training post in the Army is referred to in an article on page 36 Ed.

Sir

A case of tetanus, not operational capture of the bladder.

In November 1969 in the Indian Ocean, during my first appointment at sea, on an RFA carrying a Wessex helicopter and an RN helicopter, I was confronted at 0600 with a patient aged 40 suffering from severe lower abdominal pain rapidly becoming worse. He was apprehensive but deeply shocked.

On examination there was acute tenderness above the navel, pulse rapid, weak, small, diaphanous, suggesting partial obstruction of the bladder. The history was that a heavy lift slingmaster had landed on his abdomen whilst he was drunk and he awoke at about 2100. On coming to from the effects of alcohol he was aware of extreme pain. A catheter was passed and a small quantity of pure blood with brown fluid and pus were relieved by catheter aspiration, which was repeated at 4 hourly intervals.

Realising that a catastrophic situation had occurred and that an operation was essential, but could not be done on board, I contacted the ship's Captain and the RN flight personnel.

The interesting point to me was that having learned that the mortality rate for rupture of the bladder in Arctic climates was 100 per cent it was assumed that operation be carried out reasonably early.

A helicopter flight was arranged to fly the patient 330 miles to the RAF station at Glen 24 hours after the injury. The patient was successfully operated on for acute perforated rupture of the bladder.

The incident had a sequel in a court of law at Gloucestershire Assizes.

I am, Sir,

Yours faithfully

P. A. Corby

MRCH LECT

BOOK REVIEWS

Shigeo Bunzo Bungo, *Japanese Psychoanalysis and Transference*. Edited by Rosamary Lane. ILLD 75. 197. Oxford: Blackwell Scientific Publications. (1976).

This is an unusually new book covering both the theoretical and clinical aspects of the rapidly increasing body of evidence. It is the combined work of 11 outstanding experts, mostly trained with the founder (Bunzo Bungo), where the office is the Institute and publishing company on the Central Avenue and Chikago-cho (the street) in the Central Avenue, New York.

The volume is in the usual psychoanalytic form of both theoretical and clinical chapters. In clinical chapters, such as transference, of Freud's and Jung's theories, and of the psychoanalytic theory, are presented. In the psychoanalytic theory, the psychoanalytic theory is presented. In the psychoanalytic theory, the psychoanalytic theory is presented. In the psychoanalytic theory, the psychoanalytic theory is presented.

The book is comprehensive in dealing with the current theory of normal and disturbed thought, development, and the change aspects of psychoanalytic theory and transference. It is a book that is a must for all those who are interested in psychoanalytic theory and transference. It is a book that is a must for all those who are interested in psychoanalytic theory and transference.

Authors have been of this (psychoanalytic) theory, and this is not only for those who are working in the field of psychoanalysis, but also for those who are working in the field of psychoanalysis, but also for those who are working in the field of psychoanalysis.

Another development problem is the fact that the authors are not only working in the field of psychoanalysis, but also for those who are working in the field of psychoanalysis, but also for those who are working in the field of psychoanalysis.

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When reading a book, it is not only for those who are working in the field of psychoanalysis, but also for those who are working in the field of psychoanalysis, but also for those who are working in the field of psychoanalysis.

For the psychoanalytic reader, this book will be a standard reference book on the subject of psychoanalysis, but also for those who are working in the field of psychoanalysis, but also for those who are working in the field of psychoanalysis.

The book is a must for all those who are working in the field of psychoanalysis, but also for those who are working in the field of psychoanalysis, but also for those who are working in the field of psychoanalysis.

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The volume is a must for all those who are working in the field of psychoanalysis, but also for those who are working in the field of psychoanalysis, but also for those who are working in the field of psychoanalysis.

Philosophy: Current in History. By John M. Hayes. Third edition. Pp 155. Houghton & London. Clarendon (Longmans) Ltd. 45s.

This volume makes a bold but shrewd and in general useful selection of essays to be of value to the student whose acquaintance is not more than that of a first year's history for which it will serve as a satisfactory primer.

I would recommend the book for the student approaching a first meeting, particularly the British Learning (Oxford edition) Clarendon (Longmans) and Paul (University). R.B.M.

Philosophy: Introduction to Western Thought. By Sir A. MacIntyre. Fifth edition. Pp 304. Houghton & London. Clarendon (Longmans) Ltd. 50s.

This is a well produced, readable and easily handled book. It will prove valuable to both the philosopher himself in giving survey and also to the more general student who approaches the world after having to survey and select passages in his own way when he approaches reading his students. The student who wishes to read a volume of 300 pages in the first chapter and has decided philosophy. The volume is short and is very good, providing a survey of all the basic points of philosophy in one book. P.M.H.

Philosophy: Western Thought and Tradition. By E. C. Hughes. Fifth edition. Pp 192. 20s. Houghton & London. Clarendon (Longmans) Ltd. 25s.

This highly respected volume of a well known book in this series is volume 1, now revised fourth time and is a good introduction to the student of philosophy.

The history of the philosophy of some western and development should help to reveal some of the best and more difficult material in the world.

In all a wide range of methods is described together with their changes and development of philosophy. A useful practical manual for the student. R.B.W.

Philosophy: The Philosophy of Mind. By A. R. Thompson. Third edition. Pp 162. 1s. Houghton & London. Clarendon (Longmans) Ltd. 17s.

This collection of articles which mostly appeared in the *Philosophy* has again been revised for a revised edition. I think it is long enough of the volume in this series in this — and the basic elements of this type of philosophy, particularly between applied science — biology.

— general method and style. The book is a very good primer in this field in which many have been passing this in their own way. The importance of philosophy has been largely in this field and there is a valuable part between the

introductory section and the student who is not yet ready to read it at all.

The new edition is a very good and comprehensive volume in the first in the series. It is a very good volume in the series. It is a very good volume in the series. It is a very good volume in the series.

The volume is a very good volume in the series. It is a very good volume in the series. It is a very good volume in the series. It is a very good volume in the series.

Perhaps the most of the book can be said to be that the first of the previous edition has been revised for many years and I have been happy to have a volume in the series which is a very good volume in the series. It is a very good volume in the series. It is a very good volume in the series.

Philosophy: Introduction to Western Thought. By Sir A. MacIntyre. Fifth edition. Pp 304. Houghton & London. Clarendon (Longmans) Ltd. 50s.

With each new edition of this volume the student who has been the most of the series has been the most of the series. It is a very good volume in the series. It is a very good volume in the series. It is a very good volume in the series.

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Journal

of the

Royal Naval Medical Service

(The Medical Staff of the Fleet) 1845-1973: *Specialists for the Admiralty's needs, for the Fleet*

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1. *Journal of the American Medical Association*, 1970; 213: 1000-1001. (Reprinted with permission of the American Medical Association.)

EDITORIAL

Included in this *Form 15* description of the programme for the Third Symposium on Naval Medicine. Readers will be aware that these symposia are held every three years and provide us with a unique opportunity to disseminate to interested medical officers that the Naval Medical Service is so the first in many fields of modern medicine.

The Third Symposium has, as its basic theme, the subject of *Respiratory Stress in a Naval Environment*. Stress is now almost as much a household word as 'pollution' and in the Navy it is constantly met with in a variety of forms beyond those familiar to all doctors in general practice today.

In the Navy stress may arise from the accumulative effect of several conditions under which the sailor must expect to have to work — such as the effect of confined living spaces, exposure to heat and cold, draughting currents and exposure from rain. Next to mention only a few. It can also arise from the special demands in which particular sections of the Navy have to carry out unusual duties, as in helicopters or under water, in aerial and conventional submarines or on Commando duties. All these stresses produce their own natural conditions and reactions, and it is the task of the naval medical officer to forecast these, anticipate the problems and solve them as they arise. That this task is met with efficiency and efficiency will be clearly shown by the series of papers which are to be presented.

Broadly speaking the Symposium divides into three main areas in which stress is manifest — occupational, medical and social. It will be seen from the programme

that one original challenge was successfully met in the last in this particular session, but that is only to be expected in the treatment of such a subject. However, the Symposium is not only confined to papers and discussion but there will be numerous exhibitions of recent work done by naval medical officers and here the original work will be well represented. An address there will be a display in the Library illustrating the theme of *The Doctor as a Navigator*.

On this occasion we are particularly grateful to Dr C. A. Clarke, President of the Royal College of Physicians, who has not only allowed us to use the Royal College but has kindly agreed to Chair one of the sessions himself. Other Chairmen will be — Professor W. R. Kenney, Professor D. N. Widdler, Professor K. W. Donald and Sir Paul Mollison.

That is our big theme to these medical conferences outside the Service that our problems and requests are not limited to ensuring an adequate consultant service for ourselves or to the provision of suitable postgraduate training programmes as potent through their lectures are. We will also include our patients — four major difficulties inherent in a conventional medicine which does not always seem to take adequate account of medical needs beyond the coverage of the National Health Service. It is therefore hoped that there will be a big response from all medical officers to this Symposium so that we can only show clearly our support, both of the need for a free and independent medical service, but also for those medical officers who are doing so much to ensure the health and safety of the sailor in the modern Navy.

ARTICLES

INFLUENZA VACCINATION IN A TRAINING ESTABLISHMENT

By J. B. GILL, P. K. FINEY and J. W. G. SMITH

SUMMARY

Of 1596 boys in a Naval Junior Training Establishment, 61% were inoculated in December 1971 with a live-attenuated vaccine containing 400 CCA units of the Hong Kong strain of influenza A virus. Approximately 4 weeks later an outbreak of influenza developed, caused by the Hong Kong virus. The overall attack rate was 24%. Of the unvaccinated boys 46% became ill and of the vaccinated boys 11%. Serological evidence of infection was detected in 49% of the vaccinated boys and 89% of unvaccinated boys who became ill. It is suggested that the vaccination programme prevented at least 104 cases of influenza in the establishment.

Introduction

In Britain most schools and similar establishments increasingly regard influenza control as a degree of protection (Davenport 1970; Chappin, Maxwell and Kervelap 1971). However the efficacy of vaccination must tend to vary in different years depending on such factors as the antigenic relationship between the vaccine strain and the current virus, and the extent of the outbreak (Smith and Pebody 1974). Experience derived from the use of influenza vaccine in different years must therefore be considered in deciding when and where vaccination should be employed. This report describes an influenza outbreak during the winter of 1971-72 at a Royal Navy Boys Training Establishment where

an appreciable proportion of the boys had already been vaccinated.

Materials and Methods

PMV Centre is a short-term training establishment which boy recruits to the Royal Navy join for a 44-week study course in general and technical education including seamanship. The boys are aged 15-18 years and divided into 3 Divisions and stay in well-ventilated and heated mess decks at 40 boys occupying 14 top bunks spaced at 66 cm apart. They spend about half their day at school and half at outdoor activities or sports. There is a permanent staff of 600 officers and men who sleep and eat separately from the boys. A total of 1596 boys were present during the influenza outbreak which occurred between January 11 and March 30 1972.

The boys were vaccinated in early December 1971 by the subcutaneous injection of 1 ml of BOM Vaccine containing 400 CCA units of the Hong Kong strain of virus (A/HK/31/55) and 300 CCA units of influenza B/Vic/68/63/70. The Hong Kong strain of influenza A had been circulating in the United Kingdom since 1968 and in October 1970 about half of the population in the United Kingdom possessed serological evidence of immunity to this virus (Smith and Pebody 1971).

Boys with influenza-like illness were first seen on January 11 1972 about 100 weeks after completion of the immunization pro-

groups. All potential respiratory illnesses were between January 11 and March 20 1972 were considered as possible influenza. In as many cases as possible confirmation of the clinical diagnosis was sought by the serological examination of paired sera and consecutive specimens of sputum for complement fixing antibodies against influenza A. The last case in which serological evidence of influenza was found was seen on March 20 1972. In cases which did not demonstrate a four-fold rise of antibody to influenza A, observations were made for response to other viruses including adenovirus B and adenovirus 19. No evidence of infection with other viruses was obtained during the period of study.

Results

Of 1500 boys, 963 (64%) were vaccinated against influenza. The 535 boys (35%) who were not vaccinated included 468 recruits who arrived in PWS Camp after the programme of vaccination was finished. Thus, of the 1510 boys present in early December 1971 when the vaccination programme was carried out, 54% received vaccine. The staff was not offered immunization.

In all 1510 boys were seen with illnesses which were considered as possible cases of influenza (Table 1). There was no apparent difference in the severity of the illness seen in vaccinated and nonvaccinated boys. The incidence of influenza-like illness was less among the vaccinated boys (53%) than among the nonvaccinated boys (187%).

Serological tests for influenza were obtained in 106 of the 534 cases. Of these unvaccinated cases 62 were vaccinated boys, of whom 8 (13%) had serological evidence of infection. Sixteen of the unvaccinated cases were unvaccinated boys of whom 26 (58%) had evidence of infection with influenza A (See Table).

Discussion

A comparison of the immunization: clinical and serologically proven infection in vaccinated and nonvaccinated recruits supports the vaccination had a definite beneficial effect. The vaccination was not of course carried out by a process of random allocation using both vaccine and placebo antigens. Nevertheless, the groups of vaccinated and nonvaccinated recruits differed only in respects unlikely to be of importance. First of all recruits not vaccinated 468 had arrived at PWS Camp after the programme of vaccination had been completed. These late arrivals worked at work and play and on most days with those who were earlier arrivals. They were of the same age groups as the early arrivals and came from similarly selected parts of the United Kingdom. Influenza had not been circulating in the establishment or to any significant degree in the United Kingdom before their arrival so that the basic immunity of the two groups should have been similar. The almost rate of illness in Britain among the unvaccinated boys (187%) was 1·4 times greater than in the vaccinated boys (53%). Of these least infectious was serologically proven in 26% of the unvaccinated boys and in 13% of the vaccinated boys who were ill—a 2·1 fold difference. The degree of protection provided, by a calculation from other figures is approximately 70%. The proportion of vaccinated ill boys who were investigated was 30% and of unvaccinated ill boys 68%. The reason for the difference is not known. The procedure adopted was to investigate a many of the ill boys as possible. A possible explanation is that at the start of the outbreak a greater proportion of cases were not investigated and in this time few of the vaccinated boys were ill. Thus, the possibility exists that vaccinated boys might a greater exposure to influenza than unvaccinated boys in becoming ill.

The influenza outbreak in the United

Kingdom in the winter of 1931-72 was relatively mild (Smith and Pollard, 1971). The outbreak at HMS Ganges, however, despite a vaccination rate of 81% was widespread with 151 boys, 95 (63) suffering from an illness clinically diagnosed as mumps. The possibility should be considered that the outbreak might completely have been prevented had a higher proportion of the recruits been vaccinated, perhaps, to go with the staff (Blue, 1973; Cunningham *et al.*, 1973). However outbreaks, here, have occurred in barracks and schools despite vaccination rates of 83% (Linnemann, 1969) and 92% (Watson *et al.*, 1971). Such observations suggest that in institutional conditions, with the vaccines at present available, even complete vaccination may not prevent outbreaks.

It is not possible to determine how many boys would have suffered from mumps had vaccination not been started but, however, if the attack rate among the

unvaccinated boys (26.7%) is applied to the whole establishment then there might well have been a total of 265 cases instead of the 151 that occurred. It might therefore be considered that the vaccination programme prevented at least 114 cases of infection.

Acknowledgments

My thanks are due to the Captain of HMS Ganges, W. N. Ash, MNS Royal Navy and to CMT(N) Croxall who helped to compile the data.

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Table 1

Number and percentage of boys with clinical and serologically proved infection according to vaccine group

	No. % of recruits	No. with infection (No. diagnosed %)	Serologically confirmed infection	
			No. proved %	No. probable %
Unvaccinated	562 (80)	41 (7.3)	40	11 (2)
Part vaccinated	625 (89)	148 (23.7)	46	99 (16)
Total	1187	189 (15.9)	86	110 (9.2)

AN APPRAISAL OF INFLATABLE SPLINTS

by R. C. Quinell

ABSTRACT

Many of the features of the currently available inflatable splints are described, with particular reference to the limb and torso splint. The paper, which starts with a history of pneumatic splints, was inspired by the increasing number of people, even doctors and nurses, who, though they might have heard of inflatable splints, had never seen them demonstrated in detail.

History

The use of inflatable splints in the treatment of limb fractures was first reported by Curry (1944) from the USA. At that time the splints were constructed of rubber with a valve, which in practice, against accidental puncture, in effect ensured the design differed little from the models of today, both as to form and function. Curry's splint, one of the long leg variety, was used particularly for the emergency treatment of fractures below the knee. For the emergency treatment of forearm fractures Curry advocated that the leg, he noted it is Thomson's splint and that system be applied to the forearm through his inflatable leg splint in much the same way as a rubber wrapping is used for this purpose today. Despite the advantages recorded at this publication, this early splint did not achieve general acceptance. Presumably this was due to the poor design qualities of rubber. Synthetic plastics had not at that time been developed at this time.

Fourteen years later Gardner (1958) apparently unimpressed with the earlier paper, published an article on double rolled inflatable sleeves of vinyl film remarking that 'applied to the human leg

and thigh sleeves unexpectedly were found to splint limbs'. This long delay in the development of pneumatic splintage is easily rather remarkable.

Van Nessel (1966) studied these earlier publications and described patients of his whose fractures were given successful emergency treatment with vinyl air splints according to various complications not described by Curry. In 1966 also inflatable splints were first used by the Royal Naval Medical Service.

It is strange that as recently as, just years ago, Chalmers (1968) detailed many of the generally accepted conventional splints and had this to say of inflatable splints. 'For completeness it should be mentioned that in the past few years air splints have been developed which can do the same job. However they have their own problems and are probably not as satisfactory as the above splints'. In contrast Capperwood (1963) had written 'The use of the air or inflatable splint as the emergency treatment of simple and compound fractures of the lower limb below the knee is far superior to the conventional method'. What then is the place of the inflatable splint today?

Clinical Applications of Inflatable Splints

The principal property of inflatable splints, other than splintage, is their ability to distend, pressure evenly, then pressure out in the emergency treatment of limb fractures.

- A. Inflatable splints have also been used as means for the emergency treatment of

- 1 Cervical spine splints (Voss 1940)
 - 2 Arm splints
 - 3 Lacerations and lacer of the air circulation (Cary 1940)
- B. Inflatable splints have been applied *post operatively*
- 1 As a dressing after amputation (Harrison 1961)
 - 2 As a dressing after operations for vascular injury
 - 3 As an additional fixation after a femoral fracture and to reduce oedema compressing a large area of devascularized skin (Gardner 1962)
 - 4 As an immediate protection after below knee amputation for vascular insufficiency (Lamb, 1969)
- C. Inflatable splints have an application in more specialized fields
- 1 In the prevention and treatment of air embolism of the neck, until constantly secondary to bone fractures (Kawakami et al 1970)
 - 2 In the treatment of lymphoedema
 - 3 In the prophylactic treatment of leg ulceration by the use of inflatable splint trousers (Gibson 1971)

Physical Action

The following features of inflatable splints are of importance:

- 1 They work because a column of compressed air is rigid as rigid as a plaster with a fractured limb and holds the bone in position by virtue of its rigidity
- 2 Pressure is evenly applied and is usually results in some reduction of oedema
- 3 When inflated there is complete adherence of the splint to the limb allowing slipping to be avoided

- 4 The splint elongates during inflation and the corners were characteristic of being protrusions. This has been called *autoextension*

When to Use Inflatable Splints in the Emergency Treatment of Limb Fractures

The T and E Splint (Tibio Splint)

At the present time, the primary use of an splinting is in the emergency treatment of fractures distal to the knee. A long leg splint (Fig. 1) is preferred. Below knee splints are then needed at all times for a fracture of the distal shaft of the tibia for insertion for a multiple fracture. Current opinion is that inflatable splints are suitable for temporary use with a cast, before the knee being both comfortable and effective.

The Pelvic and thigh Splint (Groin Splint)

A recent introduction this splint (Fig. 2) was designed primarily for the emergency treatment of fractures of the hip. A simple splint, it fills a gap in the treatment of fractures and dislocations affecting the pelvis as well as femoral fractures. Until now effective emergency splinting for these injuries, which results in a fixed band



Fig. 1. Cast in the groin. The splint is inflated by means of a pump and the foot is held in position by a strap. The splint is inflated at a pressure of 100 mm Hg.



Fig. 4. The foot of a legged man in a splint, removed, reflecting the fact that in this case, removal of the splint while the patient was in pain, was the mistake. If the splint was not removed, rapid relief would have been achieved.

1. Inflatable splints may produce what patients are being saved through deep, extensive pain memory or other rough country. In these or similar circumstances, it is probable that in the interests of the patient that a canvas or tough plastic protective cover be applied over the splint.
2. Occasionally flaring of the contact surface, a feature of polyvinyl splints, may cause multiple minor blisters to appear where there is no contact between the skin and the splint. Fortunately this is rare and only follows prolonged application of the splint. Blistering a splint side for the blisters may become irritated and peelable upon use, give off a smell likely that the

splint will be required for more than four hours, a wise precaution is to apply neosporin over the limb before application of the splint when it will be found that blistering is too likely.

3. Exacerbation of the underlying skin by frost, either during hot weather or following prolonged use is also largely avoidable by the judicious use of neosporin.
4. Although sensitivity to rubber has been recorded in reports on earlier splints, there is no present record of sensitivity to polyvinyl splints.
5. As the tendency of an inflatable splint is to contact any indentation of a fracture or reduce any deformity, even or disunion, a not infrequently happens that the severity of an injury is underestimated after the loss of first-aid has been made. This is an undoubted disadvantage. When therefore an legged person arrives in casualty without a splint, it is sound practice to X-ray him prior to its application.

Contraindications

1. In general, weights above three splints should not be used for fractures or dislocations involving the elbow joint or above. Not only may there be grave proximal damage but on occasions the joint may be made worse.
2. If symptoms or signs of arterial occlusion or nerve compression develop after inflation of the splint, the likelihood is that some form of trapping mechanism is in place and it is therefore prudent to deflate immediately to a level only just sufficient to splint the limb. If this fails to remedy the situation, the splint should be removed and

possibly, conventional splintage applied.

2. Inflatable splints stop venous and capillary bleeding and reduce arterial bleeding. In the conventional case in which profuse haemorrhage is not controlled by even a wound pack under the splint, no attempt should be made to relax the splint by popping up the splint splint — either the splint should be removed and direct pressure brought to bear on the bleeding point.
4. When obviously dirty bone ends are protruding from an open wound it is usually prudent to not conventional rather than inflatable splintage. Less the bone ends contact and compromise the depth of the wound.
5. In the unlikely event of a patient complaining of discomfort under an inflatable splint, then the splint should be checked, re-applied if necessary fixed and if still an uncomfortable animal.

Advantages

1. Inflatable splints provide virtually without exception, constant contact for all patients treated. This can be contrasted to rigid conventional splintage coupled with maintenance with no tendency to slide when relaxed.
3. The splint reduces post-traumatic systemic control haemorrhage particularly capillary and venous and prevents deep venous thrombosis.
1. The splints are simple to use and cause only momentary disturbance to the patient and no injury both to application and removal.
4. The splints are valuable reusable after appropriate disinfection, have

a relatively long life and take up the minimum amount of storage space.

5. The splints are transparent and indolent and prevent gross body temperature in water without resulting in a local under pressure (Curry 1944). This work has been tested and confirmed in our own department and applies to the pelvic and leg splint as well as to the long leg splint. The application of a life jacket (May Day Agreement, Patient Number 1989) is an obvious additional safety factor.
6. Above all, the splints appear as expensive, experimentally safe (Gardner 1971).

Means of Inflatable Splints

Inflatable splints are simple to use, yet experience shows that they are commonly and difficultly applied or wrongly managed. A complaint by a patient that the splint has not relieved his symptoms is almost certainly an indication of faulty application.

Aftercare made by first-aiders includes

1. Failure to apply the splint and correctly.
2. Incorrect use of the valves.
3. Incorrect use of the pump.
4. Failure to protect the splint from pressure.

Aftercare made after arrival at hospital includes

1. Failure to take steps to prevent continuation of underlying condition.
2. Failure to prevent bleeding particularly under blood pressure dressing.
3. Failure to remember that inflatable splints are indolent and need not be removed prior to X-ray.

1. Indentable spheres of sphers with smallest damage to them.

Simple though indentable sphers are, practical experience in their use is scarce (4,7). Sole dependence on advice or instructions written on the sphers leads all too frequently to failure. It should never be assumed that anyone knows how to use them until he has received personal instruction and demonstrated that he fully understands the principles, applications and pitfalls and can apply the sphers properly. Regular instruction in this matter is as important as in any other aspect of bird-and. Therefore, one should be taught to appreciate that there is a little more to the satisfactory management of these sphers than perhaps at first meets the eye and should make a particular study of their disadvantages and how to avoid or minimize them.

The Effect of Indentable Sphers on Link Cavitation

Adams (1965, 1971) demonstrated a reduction of arterial flow in unoperated limbs in indentable sphers at normal working pressures ranges (15-20 mm Hg) and within complete arterial shutdown at pressures in excess of 40 mm Hg. Adams (1965) also suggested a modified sphers incorporating longitudinal indentations, and also indentable systems to overcome this problem.

Current opinion (London, 1966; London 1977) is that Adams's case has been overstated and that even if reductions of arterial pressures do occur, are harmful, regular are evident from clinical practice to date and no case of complete arterial shutdown have been observed.

However, it has been seen that vascular supply due to some forms of trapping mechanism may occur after the application of an indentable sphers. Hence it is prudent that regular checks on the peripheral circulation should still be carried out in all age groups and that distally both distal and neck should be removed before the application

of lower limb sphers.

Conclusion

Most of the known features concerning indentable sphers have been outlined in this paper and some have been dealt with in depth.

It is hoped that in the future all prospective users of indentable sphers be given both theoretical and practical instruction.

All the extremely new policies and high sphers it should be said that to use it in action is the really convincing argument of its success.

Indentable sphers are very good, but general acceptance is coming much more slowly in this country than their advantages would seem to merit.

Acknowledgements

I should like to record my thanks to Surgeon Captain P. D. C. Pugh for his valuable supervision of the presentation of this paper to Mrs. Pugh for the excellent photographs to Mrs. Allen for her editorial support and to Surgeon Rear Admiral G. A. Jones, RNO for helpful criticism and permission to publish.

The work was carried out on the Orford sands, Unit of the Royal Naval Hospital, Gosport.

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AN ANALYSIS OF 300 99mTc PEROCHLORATE BRAIN SCANS

By Marilyn A. Hayford

ABSTRACT

Brain scanning using sodium radio-pharmaceutical techniques is now well established as an invaluable diagnostic tool in the delineation of intracranial lesions. In this paper 300 cases with suspected intracranial pathology are presented and a comparative analysis of the 48 positive peak up results with EEG and skull X-ray results.

Introduction

The accuracy of the radioisotope brain scan has been established in a number of large series of sodium ^{99m}Tc and Puget 1964; Quance, Snodgrass and Hyman 1965; Wicks, Mays and Roper 1965. The simplicity of performance and control risk to the patient coupled with the actual ability to visualize the lesions makes this an ideal method of screening, while the rapid development of better scanning equipment and the introduction of the gamma camera with its provisions in radio-pharmaceutical labeling, has resulted in improved resolution and visualization of lesions.

The majority of earlier studies were accomplished with ^{99}Tc labelled human albumin and later with ^{99m}Tc diethylenetriamine but with the introduction of short half life ^{99m}Tc perchlornate obtained from ^{90}Mo generators the ease of availability and production and the most ideal energy of 140 kev has established this as the major agent used in brain scanning today.

Materials and Method

From November 1969 to July 1971 a

total of 300 patients from the Royal Naval Hospital, Haver was scanned for suspected lesions with ^{99m}Tc perchlornate in the clinical radiology unit (unitary of Naval Medicine, Aldershot). In this study the case notes were reviewed at least five months after the scan was performed and the patients final diagnosis and disposal noted along with post-operative results and findings at operation where relevant. Although this does not preclude some false negative being noted it is assumed that after five months if any post-operative disposal the majority of intracranial lesions would usually well have become clinically apparent.

The ^{99m}Tc perchlornate used was obtained from a Daplar ^{90}Mo generator and each patient received 1.10 mCi IV having been given 500 mg potassium penicillinate to block the thyroid and choroid plexus and heart before exposure. All scans and examinations were performed half to one hour after injection and AP lateral PA and oblique views taken as indicated by clinical requirements.

The equipment used in this series was either a Picker Magnamatrix 500 or a Nuclear Chicago Phorogamma HP camera and either static phenomena and some photos, studied accordingly.

Results

Of the 300 patients scanned 48 (16%) were suspected as positive and the distribution of these positive cases is given in Table 1. The six false positive cases were confined to our early experience in stud-

TABLE 1

Lesion	Number	CNS	Ant. Venous Malformation	Cerebral Abscess	Subdural Hematoma
No. of cases	15	10	1	4	1
%	45	41	3	12	3

TABLE 2

TECHNIQUE	72 Patients	Asymptomatic	Microapoplexy	Asymptomatic	Cerebromeningeal	Cerebral	Cerebello-thalamo-optic
No. of cases	4	1	1	2	1	6	1
%	45	26	11	3	5	33	10

prising problems posed by normal variations in venous configuration at the base of the brain, and the choroidal plates or the superior longitudinal veins frequently demonstrate a prominent right transverse sinus which often gives an asymmetrical form of increased activity in the posterior loop. Again in more than two thirds of the patients an area of increased activity can be seen in the posterior temporal region on the lateral view due to uptake of radioisotope in the choroid plexus. This often causes confusion in interpretation. The administration of 400 mg of potassium perchlorate as least prior to injection will eliminate the uptake in the choroid plexus, but for various reasons this blocking agent was not used in the first 30-60 patients in this series. Of the 42 remaining patients, whilst 19 were proven neoplasms, and 23 were non-neoplastic lesions.

Table 1 lists the 18 histologically proven neoplasms, 8 of which were malignant, and the remaining 11 primary lesions. Figs 1 to 5 demonstrate the variation of skull plate appearance in several different tumours while Figs 6, 7 and 8 show intracranial malformations, CVA and subdural haematomas respectively.

Among the 42 patients with proven positive scans 23 had an EEG performed and 24 had a skull X-ray taken as shown

(Table 1b). Of the 25 EEG's done 13 or 52 per cent were interpreted as positive and of the 9 EEG's performed on patients with primary or secondary neoplasms 4 or 44 per cent were positive. Skull X-rays were positive in 5 or 13 per cent of the 24 patients examined and in the 12 patients with neoplasms, who had skull X-rays taken 2 or 20 per cent were positive.

Although the primary application of brain scanning is the detection and localization of neoplasms, it is of considerable value in the demonstration of non-neoplastic intracranial lesions. Subdural haematomas appear as a crescent shaped peripheral density on the affected side on the AP with an essentially normal lateral view (Fig. 1b). Cerebral infarctions show wedge shaped abnormal uptake areas corresponding to the area supplied by the affected

TABLE 3a

Lesion	EEG	Skull X-ray
No. examined	25	24
No. of +ve	13	5
%	52	21
No. examined with neoplasms	9	10
No. of +ve	4	2
%	44	20



Fig. 1. Class I preparation.



Fig. 2. Class I preparation (L) and (R).



Fig. 3. Class II preparation.



Fig. 4. Microleakage of Class II preparation.



Fig. 5. Microleakage of Class II preparation.

width (Fig. 7). With the appearance of these classical apical discolorations, one can usually give support to a classical diagnosis, though it should be pointed out that one is usually unable to differentiate between amalgam and non amalgam restorations from the x-ray picture and anamniography may be required to clarify the condition.



Fig. 5. A breast specimen (unfixed).



Fig. 6. A breast specimen (fixed).



Fig. 7. A breast specimen (fixed).

Discussion

The most significant point of this study is that breast screening depicts problems with interpretation of chestnut uptake rates at the base of the breast and in the posterior zone. It shows increases in the detection of microcalcifications from the FFD or dual X-ray. In other words (Wheeler *et al.* 1967) it has been shown to be as accurate as stereography with the added advantage of ease of performance and less hazard to the patient. The average whole body radiation dose for a 5 mCi exposure is 80–120 mrad and the giving of 400 mCi postmenopausal women will reduce the dose to the thyroid and stomach considerably bringing the transmission well within the acceptable limits.

Acknowledgements

The help given by the clinical breast units who referred the patients and the radiologists who interpreted the dual X-rays, making this analysis possible, is gratefully acknowledged.

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FEMINISING INTERSTITIAL CELL TUMOUR OF THE TESTIS

By S. F. Gray, H. Chaudhri, A. C. Boustell, and N. J. Blacklock

ABSTRACT

A case of an interstitial cell tumour of the testis associated with bilateral gynaecomastia is described. The patient received exposure amounts of oestrogen to the testis whilst the 17-oestronoids were within normal limits. Analysis of the testicular tumour removed at operation showed that it contained much more oestrogen, androstosterone, dehydroepiandrosterone, DHEA, and androstenedione, than did the non-neoplastic interstitial tissue surrounding the tumour.

It is suggested that these steroids produced by the tumour were the cause of the patient's feminisation, and that there were two effects working each other, viz. the action of oestrogen itself and the presence of sufficient amounts of readily androgenic steroids to lower the normal level of testosterone production by the testis.

These effects could have been gauged in two different ways, indirectly by classification of the negative feedback mechanism of the pituitary causing low HGH to reach the testis, and directly by the inhibition of the enzyme concerned with the normal biosynthesis of testosterone in the testis.

Introduction

Interstitial tumours of the testis, better at 1-15% of all human tumours (Chaudhri and Moore 1962; Collins and Page 1966) and interstitial cell tumours comprise only about 1% of these (Henderson and Moore 1962; Gray and Moore, 1973; Collins and Page 1966) (the two steroid producing isotypes are quite rare). Two distinct clinical groups are reported in the literature

viz. the prepubertal cases in which there is precocious virilism with elevation of serum 17-oestronoids (Bishop van Marck, Willett and Arnold 1960) and an adult group in which is observed few interstitial dehydrogenase isozymes although some do exhibit gonadotrophin which usually reflects the extent of the tumour. In some well documented cases excessive amounts of oestrogen have been demonstrated either in the tumour itself (Budd 1957; Powell 1958; Hunt 1959) or in the urine (Powell 1958). In many of these cases there was an associated depression of testicular function manifested by decreased primary and libido effects (1957) and in some gynaecomastia was present (Lowe and Steward 1959).

Gynaecomastia of a transient nature can be seen in several conditions when it can be regarded as being physiological. Examples are neonatal gynaecomastia due to transplacental oestrogen (Chenwood 1971) and pubertal gynaecomastia attributable to interference in the hypothalamo-pituitary-gonadal loop (Kaufman, Kauschke and Linder 1971). Tumours of certain character with oestrogen can cause gynaecomastia so that it is clear that the symptoms in this case of an unknown disturbance which may be attributable to endocrinology and elucidation by a biochemical approach.

We had the opportunity of studying a patient who exhibited bilateral gynaecomastia with symptoms of decreased testicular function related to the presence of an interstitial cell tumour of the testis and report on the clinical, pathological and biochemical findings.

Clinical Report

A 34-year-old male officer of the United Navy first attended his sick list in July 1956. His complaint at that time was one of early morning nausea associated with occasional vomiting. Michael W. Gilbert, Deputy Chief of Staff (Sp-4), followed in attention, recorded no abnormalities and as his symptoms gradually improved he was not investigated further. His recurrent symptoms started February 1957 when he noticed a gradual bilateral enlargement of his breasts (Fig 1). These were not significantly painful but were tender on palpation. The breast enlargement continued but as he was otherwise well he did not seek medical advice. During July 1957 he married and was subsequently decorated by a branch of the Navy and by exposure through medals to stress an erection. He sought medical advice and an admission to the Naval Naval Hospital. Under a small ill-defined lump was detected on the upper pole of the left breast. A left mastectomy was performed in September 1957. His post-operative course was unremarkable and within a few weeks of the operation he began to regress. About several months following the removal of the tumour there has been partial regression of the gynecomastia; plastic surgery to reduce breast size may be necessary as regression is incomplete.

Pathology

The specimen consisted of the left testis, and 12 cm of spermatic cord. The testis measured 4.5 x 3 x 2 cm, an increase in size was to contain a well-circumscribed tumour measuring 2 x 1 x 1 cm surrounded by apparently normal appearing testicular tissue. The tumour had an homogeneous, yellow, gelatinous texture with no evidence of hemorrhage or necrosis (Fig 2).

Micrological sections showed the tumour to have a compact fibrous capsule separating it from the surrounding testicular



Fig 1. Ill-defined lump on upper pole of left breast.

ore tubercles (arrow) (Fig 3). The tumour was divided up (Fig 4) (b) by broad thin vascular bands and small clumps of tumour cells were present in these bands. The tumour cells appeared identical to testicular tumours associated with testis germ cell neoplasia, embryonal and containing large round or oval nuclei with prominent



Fig 2. The testicular tumour. Fully a the appearance of a testicular cell carcinoma.



Fig. 1. The left half of a section of a seminiferous tubule of a rat testis, showing the germ cells and the interstitial cells.

semaphoric tubules. In some areas, the tubular cells were spindle shaped. Crystal beds of Randall were present in moderate numbers, running through the cytoplasm of tubular cells. Mitotic figures were present but were scarce. Tumour cells were infiltrating the fibrous capsule in the region of the testis that had not penetrated it, and were not present in the epididymis or spermatic cord. The seminiferous tubules close to the tumour were compressed and atrophic, but further away the tubules were of more normal appearance but showed reduced spermatogenesis. Close to the tumour interstitial cells were not seen but at a distance from a small mass of interstitial cells were prominent. Histologically this was a typical interstitial cell tumour of the testis that had the features of relative malignancy.

Laboratory Studies

Sexual

0.66 gms of the, white tumour and 1.90 gms of the, normal tissue surrounding the tumour were separately homogenized in cold aqueous ethanol and the fluid so made analysed for the androgens and oestrogens by both chemical and chromatographic methods. Urine collected before and after the operation were estimated by these methods for androgens and oestrogens.

Total 17 components were determined by the Jameson method. The separate androgens, androstenedione, dehydroepiandrosterone (DHEA), androsterone and androsterone-3-one were estimated in the chromatohydrolyzates by gas liquid chromatography (GLC) using a Hewlett Packard 7010A apparatus fitted with dual flame ionization detectors. Columns used were washed steel 60/80 mesh and there were packed with 1% QF-1 plus 1% DN-1 on Chromosorb S-60/80 mesh. The carrier gas was nitrogen, the temperature was programmed from 3.0 C/150°C to 2°C/min and then isothermally for 30 minutes.

The phenolonic oestrogens were determined in a similar manner to the above and the total oestrogens were quantitated by means of their fluorescence in sulphuric acid after conversion with peracetic acid in chloroform (Baker certified). In all experiments the materials tested had been compared with pure standards similarly treated.

Results

The, ESR 115 blood counts, plasma protein, liver function tests, plasma protein and lipid sera were all inside accepted normal limits. The, haematin, creatinin, phosphatase rates in the serum was zero and plasma cortisol taken in the morning and the evening were in the normal range.

Several analyses carried out on the 24-hour urine before and after removal of the tumour are shown in Table 1. The findings in the tissues examined are discussed in Table 2.

Table 1 shows that there was little change in the 17 measured outputs in the urine, but that the separate androgens DHEA, androsterone and androstenedione, after significantly after the operation. These levels were in the normal range and so were the rates of the steroids to each other. On the other hand the urinary output of androgens of 34 mg/day was very high and in the range for men this before the operation, and

fell sharply immediately post-operatively to a mean value of 4.5g/day, which was the low part of the range for males.

Comparison between the steroids found in the tumour and in the tissue surrounding it showed marked differences in the concentrations of both androgens and oestrogens (Table 2). The 17-ketosteroid level was five times and the total oestrogen level three times higher in the tumour on a weight basis. The total amounts of DHEA, an androstene and androstenedione were all higher in the tumour than in the surrounding myometrium and it was notable that the ratios of each androgen to one another differed significantly in the two tissues (Table 2). The major androgen in both tissues was found to be oestrone by GLC analysis and the cholesterol concentration was almost twice as high in the tumour.

Discussion

Certain other features of the tests such as oestrogenicity and tumour size associated with gonadotrophin but only in rare in-

stances has there been evidence of oestrogen-ness. In some, however, there have been reported very high rates of human gonadotrophins (Hishop and Somerville, 1970). Neoplasia in other sites, particularly the breasts, is sometimes associated with high circulating levels of luteinizing hormone (LH) which may cause gynaecomastia possibly by stimulation of the interstitial cells of the testis and thus enhancing their production of oestrogen (Raisz, 1972).

In the present patient, however, there was no evidence of oestrogen apart from that in the tumour, and the human chorionic gonadotrophin test was zero. Thus in the tumour tissue there was gynaecomastia caused not so much likely then that was the source of the excessive urinary oestrogen. This high level of oestrogen with the normal urinary 17-ketosteroids, androstene, androstenedione and DHEA would lower the androgen to oestrogen ratio sufficiently to cause feminization.

The high concentrations of cholesterol in the tumour implies enhanced lipoprotein activity because cholesterol is an important precursor of the steroids, and apparently the activity is reflected in the increased steroid concentrations in the tumour tissue compared to the surrounding tissue. This postulated increased activity is not confirmed when the actual number of interstitial cells in the tumour is compared with those in the normal tissue, had each cell

TABLE 1

Constituents	Per Gm Post Op Tumour Tissue	
	Pre Op	Post Op
Total androgens, ng/24 hrs	38.9	4.9
total 17-ketosteroids, ng/24 hrs	17.0	8.0
Androstene	5.1	2.0
Androstenedione	7.7	1.9
DHEA	12.6	1.1

Concentrations of the steroids measured in post-opium and their conversion for removal of the patient's interstitial tumour.

TABLE II

Steroid	Normal Tissue		Tumour Tissue	
	12.1		22.1	
Total gonadotrophins	ppm		ppm	
Androst.	Total Component		Total Component	
Androst.	From		From	
Androst.	From		From	
Total 17-ketosteroids, ng/24 hrs	38.9		4.9	
Androstene	17.0		8.0	
Androstenedione	5.1		2.0	
DHEA	7.7		1.9	
Androstene	12.6		1.1	
Cholesterol	2.1		2.1	
Androstene	2.1		2.1	

Concentrations of steroids measured in separate samples of normal tissue and the tissue surrounding the tumour. The numbers in brackets refer to the ratios of androstene, and DHEA to androstenedione in each tissue.

in the different systems have making similar contributions to the total steroid production the ratio of concentrations of the various tumour/tumour tissue would have been of several orders of magnitude. The ratio was much lower as it is evident that the steroid production in the tumour was so fast due to a very large number of cells acting, however, in an inefficient metabolic manner. This is in accord with what is known about neoplastic cells.

The greater endogen or neuropeptide ratio in the tumour (Table 2) might suggest a response to control the effect of exogenous neuropeptide synthesis, but this is unlikely because the tumour would probably not be under normal homeostatic control with actually the endogen produced by the tumour as the weakly potent GnRH, an endogenous and antineoplastic, and do not have a major contribution to the endogen response. It is conceivable that there were two effects reinforcing each other, one being the increased output of neuropeptide and the other being an over production of weakly potent endogen. If the amounts of these, particular endogen were sufficient to initiate the negative feedback mechanism of the pituitary this would result in a decrease in the amount of gonadotrophic releasing hormone (GRH) reaching the ovary. The normal testicular ovary would then produce less testosterone so that there would be very little ovarian effect to the steroids produced by the tumour.

Some explanation for the pattern of steroid production in this patient may be sought in an examination of the metabolic pathways of the steroids in the ovary. Not unlike conditions in the brain a distinct unsteroid testosterone and the other weak androgen were used either. Only a small amount of testosterone is made, and this is mainly as androstene. The concentration of each steroid usually present in the tissue does not necessarily reflect the metabolic

activity, because of differences of isomerisation, for this reason that testosterone is usually a precursor in such small amounts. It would seem that several pathways of two systems were operating in the tumour and surrounding tissue but that there were considerable differences in the concentrations and proportions of each steroid. Androstenedione is a precursor for both testosterone and the androgens (Fig. 4) so that any interference with androgen synthesis may be looked for in that part of the hypothalamic pathway. Oestrogen itself can have an effect on the testis which may be achieved directly or through the pituitary (Fanchuan and Toren, 1972). The degree of effect usually involves inhibition of the enzymes concerned with the synthesis of testosterone from precursors such as androstenedione. If the block caused by the oestrogen produced by the tumour cells in the tumour was between androstenedione and testosterone then androstenedione might be expected to accumulate unless it was being converted to androstene. This explanation is confirmed by the finding of only traces of androstenedione in the presence of relatively large amounts of testosterone (Table 2).

Thus a hypothalamic route would be set up where neuropeptide produced by the tumour previously would have inhibited



Fig. 4. Some explanation for the pattern of steroid production in this patient. The diagram shows the metabolic pathways of the steroids in the ovary. The tumour produces androgens which are converted to testosterone and androstene. The tumour also produces oestrogen which inhibits the hypothalamic pathway. The tumour also produces androgens which are converted to testosterone and androstene. The tumour also produces androgens which are converted to testosterone and androstene.

control would inhibit intracellular synthesis in the non-tumorous target, and even in the tumour itself, in favour of further intratumour formation. Such a circle would have to be broken by removal of the original source of oncogenes.

A problem is posed by the difference in concentrations of DHTA, androstenedione and oestradioles, Type I in the tumour from those observed in the blood. It may be that there, compounds were metabolized in other tissues to substances which would not be detected by the methods now available. Because of the different states of oxidation, it is conceivable that in states of circulating oncogenes could stimulate stored by deoxylation in the skin and other organs to produce altered metabolism.

Acknowledgements

Thanks are due to the following for help in the preparation of this paper: to Surgeon Captain D. C. Harris, RN, in whose department the work was carried out for proof-reading and other valuable comments to Surgeon Commander E. J. Martin, RN, for the use of the GLC apparatus, to Surgeon Lieutenant Commander R. Gordon, RN, for help with some of the statistical analysis, and to Surgeon Lieutenant A. Kingston, RN, for the clinical information on the case.

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DECOMPRESSION SICKNESS IN CIVILIAN DIVERS

By R. de C. Hamon

Introduction

Decompression sickness has been being used for many years as a hazard of diving, at least since the time of Paul Bert and diving tables, but staged decompressions have been available since J. S. Haldane devised the first one in 1901. Despite the fact that this is a well recognized and possible hazard of diving, cases will occur among professional and semi-professional divers, often as a result of exposure dives.

This short review of the cases of civilian decompression sickness reported in the literature at Naval Medicine, during 1971 has been undertaken with the object of making the data concerning these divers readily available to interested parties. It also highlights the disparity between the decompression used by the Royal Navy for confined divers and decompression used by these civilian units. The depths and times of dives given by these divers, must be regarded as approximate as there is no way of verifying these statements.

Because of the small numbers involved and the large number of variables no attempt has been made at statistical analysis of the results.

Cases

The problems have been broken down into the places where they were treated (Table 1), whether they were due to multiple dives (Table 2) and the discrepancy between the decompression actually done and that required (Table 3).

The majority of cases were treated at HMS Drake (Table 1). These cases were selected for more detailed study as they

tended to be better documented than the others.

Of these treated at HMS Drake all but one (Case 12) were attributable to confined dives and this case did not carry out the decompression required for his single long deep dive.

As can be seen from Table 3 there are great discrepancies in the decompression actually carried out and those required by the Royal Navy Tables.

It is of interest to note that six of the cases attempted to treat their early symptoms by re-breathing the water and two of the divers involved had avoided themselves in the manner on a previous occasion. These attempts generally are inadequate and may aggravate the symptoms. Of the two previous attempts one for a 'pump-only' head was successful, the other for a 'spinal' head left the victim with weakness in his legs and visual difficulties.

Of the 15 cases treated at HMS Drake

TABLE 1
PLACE OF TREATMENT

Place	Number
HMS Drake	15
HMS Eborac	1
HMS Lynx	1
Lady's	1
Private	1
Total	17

TABLE 2
TYPE OF DIVE

Type of Dive	Number of Cases
Confined and Single	16
	1

were parasternal with symptoms of radial nerve involvement. Of these cases three had been treated at BMSB clinics for a previous attack of decompression sickness. As can be seen from Table 4 the onset of symptoms was generally very rapid but there was usually a delay of several hours in obtaining satisfactory treatment as shown in Table 5. In most cases the decompression therapy produced a complete cure and even in those three cases where treatment was not completely successful a great improvement was shown which continued over the next few days. In only one case did the patient need to be treated in hospital.

One case involving the central nervous system (i.e. of posturalis labialis) had to prove false.

The diver continued diving at 1400 hours and did two dives to 130 ft each of 15 minutes duration with a 40-minute break between them. At 1800 hours the next morning 15 hours after the last dive he was woken by nausea and while vomiting and coughing experienced a sudden severe pain in his back accompanied by a shock. His back looked red and pain radiated down

the right leg. During the next two days he had a left focal headache, developed difficulty with micturition and developed some areas of anaesthesia on the skin of the left forehead and the tips of his right middle and ring fingers. He arrived at BMSB clinic 34 hours after the onset of the symptoms.

TABLE IV
Onset of Symptoms

Time in Minutes	Number of Cases	
	First Only	Cum.
0-5	4	4
5-15	—	4
15-30	—	4
30-45	—	—
45-60	—	—
Over 60	—	1

TABLE V
Delay in Receiving Treatment

Time in Hours	Number of Cases	
	First Only	Cum.
0-1	—	1
1-2	—	—
2-4	2	4
4-12	—	—
12-18	1	—
18-24	1	2
Over 24	—	—

TABLE VI
Decompression for Cases associated with B.S. Shows whether There
Was Double or First and Last at Same or Different

Case No.	First D.L. Depth	First Time	Second	Days/Case PR (First Last) Required by B.S. Tables
1	100	77	0	00
2*	100	45	45	070
3	100	00	0	00
4	100	00	0	20
5*	100	00	0	00
6	100	40	0	00
7	110	25	0	00
8	100	00	0	00
9	100	00	25	00
10	100	00	0	0
11	100	00	0	00
12	100	00	0	10
13	110	00	0	0
14	110	00	0	00
15*	100	00	0	00
16	100	00	20	00
17	100	00	0	00

* These cases occurred subsequently at the same or after the onset of symptoms.

men. He was compressed to 60 ft on unaccounted oxygen when he recovered bladder control and lost the feeling of numbness. On being brought to the surface after 4 hours and 45 minutes (Table 524) he was taken to the R.N. Hospital. By month's end he was ambulant over the next next days. The patient had a past history of back trouble having been treated in 1953–54 with traction and a plaster jacket followed by wearing a supporting belt for two years. There had been a recurrence of backache in 1967. He had a bend in his left shoulder and elbow in 1968 which he credited himself to decompression on the water and in June 1970 had a spinal fluid complication by a disc lesion treated by recompression at 2765 fsw (Drake to 165 ft) lasting 18 hours 25 minutes (Table 528) followed by a week's traction at 8744 fsw (Plymouth). The 1970 episode followed three dives to 150 ft each of 25 minutes with a 40-minute break between them.

The length of time between completing the dives and the onset of symptoms is unusual since Rivers in 1964 reported only 24% of 935 cases with a latent period between 15 and 36 hours. Another point worthy of remark is that symptoms in both patients after work a delay (34 hours) in commencing treatment. Rivers (1964) stated that the prognosis was poor when the delay of treatment was over 36 hours.

Discussion

The tragedy of cases in most of the cases is in keeping with the knowledge that the majority of bends occur within a short time of surfacing (Table 531). Miles (1944) states that 80% occur within the first hour while Rivers (1964) gives a figure of 58% in his series of 935 cases.

There appears to be general agreement that the results of recompression are dependent upon prompt treatment. However, Pooni and Walker in 1954 observed that delay in recompression tends to make re-

compression more effective and that this may be partly interpreted to mean the time period to spontaneous relief but they emphasize that this should be no reason for delaying recompression. This spontaneous relief was shown strikingly in one of the present cases. In this instance the diver had performed four dives to 100 feet, each of 25 minutes between 1130 and 1445 hours the same day. Five minutes after surfacing he developed a left knee pain, became unable to speak or pass urine. Forty five minutes later he found he was able to pass urine and after a further 5 minutes experienced an almost complete spontaneous recovery. Some residual pain in his leg responded to recompression. This was the second time in one year he had required treatment for a bend following repetitive diving, these are shown in Table 5 in Cases 8 and 17.

Perhaps the most remarkable fact that emerges from these cases is that divers can carry out a daily routine which is in the nature of three dives to 100 feet for 30 minutes each with only a short surface interval for some time without suffering from decompression sickness. The 11 cases treated at R.N.H. Drury most represent a small proportion of the total number of casualties and other divers operating in the north west of England amongst whom this type of diving would appear to be normal practice.

From this it can be argued that the Royal Navy tables are too conservative. In 1967 Hatcher proposed that with an hour's interval dives might be safely repeated. However, some different depths and times must lead to different levels of nitrogen in the tissues so arbitrary time is rarely acceptable.

The basis of calculating the steps required for combined dives is, the longer the time after surfacing from a dive the greater the percentage of nitrogen in the body is above that normally found on the surface.

Impedance is reached over a number of hours as the nitrogen is gradually released from those tissues which have a long half time.

If the original depth and time exposure of tissues is so possible to calculate the amount of nitrogen remaining in the tissue after a given surface interval. The remaining quantity of nitrogen must be taken into account when the second dive is undertaken. The US Navy Diving Manual has tables for calculating the residual nitrogen 'load' based on a mean half-time of 120 minutes, and converting this into a table to be added on to the bottom time of the proposed dive. The Royal Navy use a more, safe, rule of thumb method which makes use of the concept of the limiting time. The limiting time is shown below the normal working table and is so below, the limiting time stated as maximum risk of decompression sickness. The RN diving rules state that a diver who has carried out a dive deeper than 140 fms or below the limiting time is not to dive again for 12 hours, but if the divers are above the limiting time and the time interval exceeds six hours, then no modification of decompression is required provided that the second dive does not exceed 140 fms. If the time interval is less than six hours then the decompression must be done for the total time of the first and the previous depth reached. While the Royal Navy's method is simple it is probably too conservative and these repetitive diving schedules are currently called severe.

Table 6 shows a comparison of the decompression times reported by the RN and USN tables for three dives of 20 min each such a frequency schedule of the navy divers with surface intervals of 30, 40 and 50 minutes.

TABLE 11
Decompression for three dives of 20 min

Table	Surface Interval		
	30 mins	40 mins	50 mins
US Navy Royal Navy	55 mins 60 mins	75 mins 80 mins	95 mins 100 mins

From Table 6 can be seen the greater flexibility of a method which can make allowance for relatively short surface intervals. However, even short tables are unlikely to be of use to divers who try to get as much rest on the bottom as they can during each water and coast emergency gas work the risks involved, especially with dry mix oxygen treatment at sea and at themselves. If these divers could be educated into doing some decompression on their last dive it would be a step forward but these are men as blind as those who do not wish to see.

Acknowledgments

The author would like to acknowledge the debt that he owes to the medical officers who have reported their cases to the Institute of Naval Medicine.

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PHILIPPINE FLOOD DISASTER

By J. B. Usher

An early result of a complex and flood weather pattern (including four typhoons, 180 mm of rain fell on the Luzon province of the Northern Philippines over a period of three weeks in July 1972. One of the worst hit areas was the Ilocos Plain, the main rice-producing area. This was because of its proximity to a mountain range and the large river which traverses its entire length. This combination produced flooding which rapidly submerged many of the villages and caused extensive damage to the surrounding towns. Roads and bridges were destroyed, thus completely isolating many of the communities. The paddy fields and rice crops of the Ilocos Plain flood were washed away, giving rise to an acute food shortage (Fig. 1).

The Medical Team from DART *Amorita* made up of two doctors, two nurses and a medical orderly landed five days after the coastal downpour and joined up with an American Disaster Aid Relief Team (DART) consisting of medical personnel and engineers. The area the team was to

cover stretched from Lumbao, the nearest city of Pangasinan Province, situated 100 km north of the river to Mangassaran a distance long strip including the more 30 towns and villages.

On our arrival the situation certainly appeared serious. An estimated 1,500 houses had been destroyed and a further 11,000 seriously damaged. In addition to the food shortage, freshwater supplies were few and far between. The main power stations were under water and consequently no electricity was available. The only fully equipped hospital in the area was at Dagupan, some 25 miles distant and transport by road was impossible. It was decided to divide our efforts into three elements: medical personnel and medical teams.

Observations

Our main concern was that because of the flooding standards of hygiene would deteriorate and that cholera and its typical, if established, would be difficult to control. The only water supplies available to the villages, were the Arroyos with most of which were under water and unusable, the alternatives being forced to use flood water for drinking and cooking. Food shortages and lack of shelter had reduced the resistance of the population making them vulnerable for the spread of an epidemic.

In our area approximately 20% of the community had been immunised, although it was not certain over what period of time the figures had been recorded. The American DART Team had first compressed or molasses grain, which gave us a safe



Fig. 1. Flooded village, Pangasinan, Philippines.

ility of 1000 inoculations per hour. After an initial period we received large quantities of medical supplies and applied vaccines thus infusing the number of inoculations to be given.

Our main problem, however, was to collect the villagers into our place at one time and in consequence our capability was severely curtailed. In the first few days we inoculated 10 000 and by the time we left had administered a total of 18 000. This represented over 30% of the population in the area and added to the 60% of the community previously vaccinated gave us an overall percentage of 90.

Medical Treatment

Equipment taken with us from the ship consisted of parental drugs necessary for acute medical emergencies and emergency resuscitation and minor surgical capability. This proved to be the correct decision as the World Health Organisation had flown in large quantities of medical supplies consisting of oral preparations, the majority of which were antibiotics and antivenomous fish.

Initially antibiotics and equipment had to be taken to the patients as transport to Langueira had to be by boat and was extremely hazardous. Two rubber dinghies served our purpose admirably and in the first week we covered most of the related villages.

When the floods had subsided, transport in large trucks became possible and as a medical centre was set up in one of the hotels in Langueira. Using the limited number of local nurses as available we were able to treat mainly in-patients and had a turnover of approximately 120 out patients per day.

By far the most serious problem was respiratory infection. The Philippines still have an extremely high *Tb* rate and are only just beginning to set up clinics where efficient treatment and follow-up can be

provided. Diagnosis had to be made on clinical assessment as no radiological or laboratory facilities were available because of the power failure.

Differentiation between *Tb* and pneumoconiosis, emphysema and asthma relied on the history of a cough and the smokers of the area. Wright line was instilled in all patients because of tuberculosis and in view of its diagnostic significance.

The common presentation of *Tb* were those of haemoptysis and/or chest pain associated with persistent cough at some distance. Seven cases were hospitalised and treated with isoniazid 150 mg bi and streptomycin 1 gm intramuscularly daily. The remainder were treated with isoniazid only, these drugs being the only two chemotherapeutic agents available.

Smoker's bronchitis accounted for one third of our cases and numerous other respiratory cases were seen by us. The apparent increase in the incidence of carcinoma was because the smokers had been driven by the floods to seek higher ground outside the towns and villages, and although none were seen by the team, the majority were reported to be others.

Patients admitted to the hospital received supportive treatment directed at combating shock and preventing secondary infection. Only two patients did not respond to these measures, requiring a laparotomy to relieve large bowel obstruction due to colitis.

Evacuation and Water Control

Diseases from outlying areas were gathered into local communities mainly caused on the towns built. Here their food, water and fuel and water were stored for three emergency relief weeks.

The engineers and workers on the team concentrated mainly on evacuation from severely damaged villages which had been isolated by the floods. In three they did extremely well using rubber boats to run over 100 tonnes of medical supplies.

before a shortage of fuel curtailed their activities (Fig. 1).

Consumption of warm water supplies proved a serious problem in the villages. The village captains had ordered that all water be boiled. However, when drinking water had to be supplied, this was done by erecting makeshift stoves and arranging for the fire brigade to fill them in two-day intervals. All such points were sterilized regularly with calcium hypochlorite and covered.

Conclusions

In a disaster area of this nature the most important medical aspect is the prevention of an epidemic. The floods had produced a population with a very low resistance to infection, and conditions where diseases could spread extremely rapidly. Medical services were already extended and could not hope to deal adequately with a problem of the magnitude that cholera or typhoid would have caused.

Respiratory infection was an expected sequel to the conditions, but was not serious except as these cases aggravated by pneumonia. To



Fig. 1. Emergency water supply point.

minor casualties were numerous, making up the remainder of the toll, of our work and leaving the medical assistance hard at work both in the hospital and in the field.

Although drugs were plentiful, basic equipment and dressings were in short supply and many improvements had to be made.

In the final assessment, 150 deaths were recorded. Almost all livestock was lost, thousands were made homeless and an entire rice crop was destroyed. In the weeks of the flood. The effects of the flooding will be felt for the next two years.

GROUP CAPTAIN SIR LOUIS GREIG, KBE, CVO

(Royal Navy Doctor, Royal Air Force doctor, invariably to youth and friend of Kings)

By H. E. R. Craig



From about 1910 it was my belief, that I never personally met him during the war. I joined H.M.S. in 1912 as a cadet, remembered him with affection and many were the stories of his almost legendary doing which circulated and moved us. I well remember the Professor of Surgery, in one of his lectures, taking to his text the virtue of doing all that one could to arrest a correct diagnosis and cure, having made it all sticking to one's guns, even in the face of very heavy VIP adversity at an occasion, Louis Greig had to do.

But by his own doings I was able to build up a more complete picture of a man who had I had a closer contact, among

Sirius doctors of this century. The article is compiled as a tribute and a memory.

James Lorrie Greig was born on November 17 1885. He was educated at Marischal High School, Edinburgh and at the University of Glasgow obtaining a Bachelor of Medicine and Bachelor of Surgery in July 1903.

He had a distinguished career at Rugby Football. He played for the Glasgow Academicals and was first capped for Scotland against the All Blacks in 1908. He captained Scotland against South Africa in 1910, against Wales in 1907 and 1908 and against Ireland in 1904. His position in the field was fullback, usually the second full, but on three days the two full backs often interchanged.

He joined the Navy on February 18 1886, and was first appointed to H.M.S. Porpoise. In July 1900 he went to H.M.S. "Hector" where he was awarded a gold medal and placed second in the combined examination for promotion. In January 1907 he was appointed to H.M.S. "Whitcomb" a West country hospital ship of the Channel Fleet. He served on her for two years until he went to his next appointment in January 1909. This was to H.M.S. "Albatross" for duty at Devonport College. He remained there until January 1911 and then was appointed to H.M.S. "Chambers" the training ship for cadets. He served on her till early 1914, being promoted to Staff Surgeon on February 18 1904. This meant that for a continuous period of five years he was concerned with the medical care and training of cadets, sailors and officers. These

much less than were happy years. He left far off the records indicate that he had a very special love and enthusiasm for dealing with young people.

On January 15, 1909 Prince Albert (later to become 6th Duke of York and King George VI) went to Ontario College. At the end of the semester term 1909 he, distinguished sleeping cough.

The student of Prince Albert through *scholarship* and accompanying in staff was yet careful as that it brought into his life a man who in later years was to exercise considerably and beneficial influence upon him. The constant student officer of the College was a young Scotsman, a Sergeant RN and Louis Gray, then twenty-one years old, a graduate of Glasgow University and a hero to the cadets, not so much perhaps for his medical skill as that he had played international Rugby football for Scotland and coached the College team with a wealth, tenacity and loyalty of his group which left no shadow as to his worth. Prince Albert took a strong liking to this tough, debonair young man whose group cleared him in the columns of his rank. He gave to Sergeant Gray his confidence, his affection and his admiration and a friendship was engendered between them which was to play a highly important part in the development of his personality and character.

Louis Gray captured the Royal Navy and joined the Army as a cadet in 1907, 1908 and 1910. In those days the latter was Navy officers' versus Army officers. During the long period while he was associated with cadet training at his Commanding Officer, seems to have been an appreciation as to his good qualities. His great merit was, especially suitable for cadets' professional education, use of a high order, remarkably good physique, good at all games, a good automatic system, practical and of good judgment and special interest in First Aid Classes, which is

Physical development

There is an interesting, once dated October 4, 1910, statement that the Board has decided to accept that Dr A. F. Russell was greatly impressed not only by the real and ability of the medical officers but also by their staff and competence in coping with such an unexpectedly great epidemic of influenza at Ontario. D.G. adds his own appreciation of these highly creditable medical units exceptionally trying circumstances.

Those of us who have lived in the Saskatchewan made themselves, too, may not fully appreciate the stresses placed on the medical and nursing staff in a full-blown epidemic of influenza in an establishment of respectable dimensions in 1910 and I find that Louis Gray and his colleagues fully deserved this opinion.

In May 1914 he was appointed to the Royal Marine Depot at Dover and in August he joined the Permanent Detachment. They sailed for Canada in *SSMS Porpoise*, a White and remained in the vicinity of the port until September 1 when they remained in *SSMS Fishhawk*. On September 19 they were called the Royal Naval Detachment returned to Belgium and landed at Dunkirk. They advanced into France as far as Lille and then moved to Dunkirk and then Arras. In the next few days they were involved in heavy fighting there. What most of us would agree that the use of shell fire on land is noisy and terrifying. Louis Gray finds time in operation in a detached way of way on the pleasure of the new production. He writes in his Journal:

There was one curious effect of a high explosive shell landing in front. After the shell has burst, one hears a curious musical sound like a large trumpet gradually coming nearer and nearer and very rapidly it gets louder and louder and finally with a violent thud, hits the parapet of the trench in front or the rear wall and one feels a

fragments of shell of varying size which had caused the wounds and not unpleasant when in my passage through the air.

Louis Grogg and the branches of Royal Marines to which he was attached were captured on October 9 at a village called Merville. He kept a careful detailed journal which covered his time in a prisoner of war. It was so well written and informative that after his repatriation by exchange the Foreign Office asked for a special copy. I personally found it most entertaining. Because, it records real life encounters with Russian, Ukrain and American Prisoner officers whom I had read about in my days. One Paper and books by Frank Lynn and Herbert Hump.

After being incarcerated in a church for three days they started to march onwards. He records: "We passed a tremendous lot of German troops and in one place we were locked in machine them to pass. A Prisoner officer left his company came up to me and asked: 'What the hell are you doing in Belgium?' I answered by asking: 'What the hell are you doing here?'

After a march of about 20 miles they were put aboard a train which pointed us on all round Germany but after four days' march they arrived at the prison camp at Halle in Saxony. I can well imagine that the life of a prisoner of war was anything up on captivity prison like Louis Grogg but clearly he lived up to the good old British adage: we get a stone but not a very hard. The only note of despondency in his Journal occurred when he was unable to obtain soap water and other cleaning materials so that he could not maintain the high standards of cleanliness and hygiene he would have wished.

His comments: "The food consisted of 'Krupentzen' and coffee in the morning and a plate of soup and a portion of corn at 12. The soup was usually not bad but the portions were very seldom outside. The staple diet was baked pork with sauer-

kraut. Several times we had horse and, on one occasion only we had a small hot dog. The French officers for 30 days after this used to look badly when the porters were served out."

Shortly after their arrival at Halle the doctors of the various nationalities got together and discussed their repatriation under the terms of the Geneva Convention. Louis Grogg gives the text of his statement which is by all accounts and written in fluent French.

He records that: "I had my overcoat sewed behind the badge of my cap and unlike my budget of rank on my arm and came away with them". In December 1944 he describes the horrors of a typhoid epidemic in an adjacent camp though he was not personally involved.

In mid June 1915 he with 34 other officers were transferred to another camp at Augustdorf in Mecklenburg, Eastern, near Berlin. On June 26 he was informed that he would be leaving the following morning. They travelled to Holland via Aarschot in a Red Cross train. One exception at the Dutch frontier was very striking and we arrived at Flushing, crossing over to Tilbury next day (June 28).

Thus he arrived back in England after about nine months in prisoner of war. They were not very generous with leave which only lasted from June 28 to July 14.

It is interesting to note that on May 12, 1915, before his repatriation was even settled the Adjutant General Royal War asked "if he (L.G.) will consent to serve in the RN Division". This request must, I feel have been based on the idea that if you've got a good man you try to hang on to him!

However that 11 days in RN Service. Fortunately he joined HMS *Albatross*, the parent ship of the 4th Destroyer Flotilla based on Dover. Until October they had a continuous sail training rate off the East coast coastlines, using independently

and sometimes covering the Marston.

On October 12 1915 someone went to Denmark to be treated there permanently, while the Captain was made Commandant and SMO of the ME Coast of France. The appointment enabled Louis Grog to go to speak with his Royal Marine but again for his records. I had several interesting trips to the Front visiting Namur, Ypres and our loop near Ghent. He then became involved in organizing medical facilities for the Royal Marine Artillery gun crews in the vicinity. He took much notice of this organization himself for his records. At present I continue to visit the gun positions once a week to see my role.

In February 1916 RAE's Adventure left Denmark and returned to her old routine of being based on Dover and of going out to look for trouble off the Belgian coast. Among the last entry in the medical Journal is as follows: On the night of October

26-27 1916 the Germans made a destroyer raid on the Channel. This ship was at all hours, notice closing hatches and did not go out. I went out with my SBG in the Gyron a 100-ton destroyer. We made an attempt to get to board Mubara which had suffered fairly severely from being hit by a torpedo. The sea was very heavy and it was found to be impossible. Then Mubara broke her tow rope and went ashore. The wounded were successfully got off by a tug which managed to get alongside.

Louis Grog was married on April 14 1916. His wife came from Norfolk, Normans own country. He continued to serve in the South Coastguard flotilla till May 21 1917.

On May 8 1917 Prince Albert reported again for his duty this time to the 17,500 ton battleship, HMS Nelson (Captain The Hon Algernon Boyle) with the rank of acting Lieutenant, and born to his great delight he was shortly joined by De Grog, who was appointed to ship's second surgeon. "It is so nice having a real friend as

a minister and his very clearly. He went to the Queen, and from that time they remained virtually inseparable for the next six years.

Unfortunately a situation was developed which was to test to the full both Prince Albert's fortitude and Louis Grog's medical skills. The Prince had had an upper abscess on September 8 1914 but at spite of this, had continued to suffer from sea sickness of gastric pain. He was in action during the Battle of Jutland in HMS C14 and lost in August 1916 a dental ulcer was diagnosed and medical treatment initiated. The Prince had just managed to get back to sea in HMS Mubara when he suffered a relapse and in July 1917 he was discharged to the RN Hospital at North Queensferry with Louis Grog as attendant. They remained in Wexford at the end of August and the Prince began a period of sick leave.

But a wise decision that even when leading the greatest of fleets, and with the support of friends, his complaint would not yield to treatment and, with the modest support of Louis Grog, he explained his parents to agree to an operation which would remove the cause of all his trouble. The King's medical advisers were divided on the wisdom of an immediate operation and for nearly two months the Prince endured the onset of their debate with deepening depression. In the meantime it had been decided that he should be transferred from the Navy that Flots to the Navy that Huts and his appointment to the Royal Naval Air Service Station at Eggswell was gazetted on November 13. This plan had originated with the Prince himself and rather to his surprise, it received immediate parental approval! "My own suggestion for duty came off and Papa purred at the idea. He wrote Grog is going there so well. He is a perfect apple!"

On November 26 1917 the Prince underwent an operation for the surgical cure of

the dissection table. This was performed at Buckingham Palace, by Mr Victor Serl Hugh Raper. Staff Surgeon Louis Grogg was one of the five doctors present at the operation who signed the findings. Happily Prince Albert made an excellent recovery and reached his appointment to *MBE* *Decorations* at Crowthall on January 1 1915. As an added precaution for his health a was arranged that Staff Surgeon Louis Grogg MBE should also be awarded in the same branch of the honours.

His Service documents at this time contain several references often underlined to the effect that he was *dead to the Service*. The Admiralty obviously did not wish to lose such a man. On March 12 1915 there is a note that 'As present he is, G) is in medical charge of Crowthall in the absence of Lieutenant Parkesby on temporary duty'.

It is recorded that Prince Albert was thoroughly happy during this period. 'The Grogg and his wife had taken a small cottage at South Kensington some four miles from Crowthall the supreme pleasure of whom Waterloo Colloid doctor was helped by the chosen writer of the late year-old oak house and wedding marriage. Here Prince Albert joined them and here for the first time he experienced home life as a small male and a delighted him. It was very pleasant and real of after his day's work to come back to the cottage and the happy companionship of the Groggs.' Louis Grogg kept a splendid but confidential watch on his health while Mrs Grogg kept watch for that with the care of a mother.

Prince Albert's work at Crowthall was that of OC No 4 Squadron Royal Wing. But by the middle of 1915 the system of flying training was discontinued and on August 1 the Prince and Louis Grogg were appointed to a Canteen that at St Leonards on Sea. On October 12 they flew the Canteen together so that Prince Albert could take up an appointment on the staff of General Tren-

chard at Aldridge and they were serving there together on November 11 1915.

In March 1919 Prince Albert started his pilot's course of instruction at Cranley Aerodrome. Louis Grogg took a man of nearly 40 with the Prince with him and they both qualified. On August 1 1919 he was named to assist in the Navy List on his transfer to a permanent commission in the Royal Air Force with the rank of Major. As a result of his war service his decorations included *Chevalier of Legion d'honneur* *Belgian Croix de Guerre* *Chevalier Order of Couronne Belge* and *Order of George Meunier with Swords*.

In October 1919 Prince Albert accompanied by his brother Prince Henry flew the Duke of Gloucester's plane up to Cambridge to undergarments at Trinity College.

The two Princes together with Wing Commander Louis Grogg were officially attached to Prince Albert as Esquary and Mrs Grogg came up to Cambridge in mid-October. The King had loved South Kent for about a half and exceedingly up but comfortably home with a pleasant garden off the Thompson Road about a mile from Trinity and they made the journey to and from the College on bicycles.¹

'The Princes, majors and generally at South Kent, where once again as at the cottage at Kewbury in his Crowthall days Prince Albert delighted in the happy domestic life with the Groggs and their children.'²

There were however other advantages to be gained from residence at South Kent for it was in the period of his life more perhaps than in any other in their happy relationship that Prince Albert derived the greatest benefit from his association with Wing Commander Louis Grogg.

Admiral of the Fleet The Earl Mountbatten of Burma recalls: 'I often used to go for drinks or a drink and a gossip with my two young cousins. The atmosphere a

to which was ordinary people. One Mrs. Commander told Mrs. Lane, who, I think, was a charming, warm personality, but what a mess. It was to protect the young Prince from criticism by their father. The manner when they both acquired more beauty in middle than in get to Trinity speaker from Sandhurst, the King himself was up and said he was mortified to find that he was now being asked by people, and added: 'I thought that only cash and business could make beauty'. I remember that King Commander Louis Gwynne was asked to make up the a delicate matter instead of one of pain for the two young Prince."

On June 3 1930 His Royal Highness Prince Alfred was created Duke of York. After he left Cambridge in the autumn of 1930 Wing Commander Louis Gwynne became Comptroller of the Duke's Household. In 1931 in 1931 He had been placed on the Royal List at his own request on November 18 1930 in the rank of Wing Commander.

In the summer of 1930 Tennis was a great very much in the Duke's mind for with Louis Gwynne he had entered the RAF Double Competition and continued to their surprise they found themselves first in the semi-final and then on July 8 in the final then to their common satisfaction they were after a hard-fought match. In addition they met in the semi-final of the singles which the Duke lost to De Gwynne. In 1930 they played together in the Men's Double at Wimbledon but were defeated in the first round by two very well known players H. Hoper Barnes and A. W. Gore.

The two remained inseparable friends and on January 15 1935 King George V wrote in his diary: "Home with Gwynne at about eight and informed us that he was engaged to Elizabeth Bowes Lyon to which we gladly gave our consent. I trust they will be very happy."

The Duke's marriage on April 26 1935

continued for his association with Louis Gwynne and his family.

It is said that Gwynne brought up where he had grown his early affections at Osborne who had been the greatest friend, companion and mentor of his brother's life and the relationship a wholly intimate and had been of the warmest friends to him. He knew that his road leads to Louis Gwynne and he was both appreciative and grateful. With the Duke's marriage however and the coming up of an independent cottage it was agreed that a change should come and both entered the necessary for this. Wing Commander Gwynne retired from the Duke's Household in the beginning of 1934 though he remained for the remainder of that time the personal friendship and confidence of both King George V and his son."

He held the following appointments in the Royal Household:

Companion Under in Ordinary to King George V	1924-26
First Companion Under to King George VI	1937-51
First Companion Under to Queen Elizabeth II	1952-53
Deputy Ranger of Bucklebury Park	1953-55

He was made a Commander of the Royal Victorian Order on April 26 1935 and was knighted in 1931.

On the outbreak of World War II Sir Louis returned to the Active List of The Royal Air Force. On July 28 1940 The Right Honourable Sir Archibald Sinclair, B. C.M.G. M.P. Secretary of State for Air appointed Wing Commander Sir Louis Gwynne KBE CVO as his Personal Air Secretary. The appointment stated that "during his duties the Personal Air Secretary will make and maintain contacts on behalf of the Secretary of State personally with Heads of Diplomatic Missions in London so far as may be necessary. Similarly he will keep in touch through the appropriate channels with the various

Allied force, now forming in the counter-attack and also with distinguished foreigners who may be assisting in the reconstruction of treated personnel for the Royal Air Force and in other ways, helping to emphasize the broad international character of our war effort.

This appreciation provided an outlet for Louis George's energies and his varied activities and came in many guises of the world. With his flair for understanding men and his enthusiasm for the Royal Air Force he was well-suited, not just as a racing YIP, but as a brother officer trying to help those with problems, wherever these came.

Many fighting men of the Allied Forces will remember with pleasure the happy family Sunday afternoon races, parties which he and Lady Georg gave at Thatched House Lodge where the guests could forget for a short time their responsibilities, and stresses.

In Louis was protected Georg's Capet on October 1, 1941. On August 25, 1942, HRH Prince George Duke of Kent, was killed in active service when a Sunderland bomber, in which he was travelling in England, crashed in the North of Scotland. A colleague remarks: "I will remember Sir Louis going off to try to break the news of the death of her husband to HRH Prince, Walter, Duchess of Kent. He told me that he felt he had lost a son".

The Lords seated in the Royal Box of the Royal Air Force on October 1, 1942 and had eight years of good health and active endeavour. He was a Governor of the Westminster Hospital from 1948 to 1971, Chairman of the Not-Forgotten Association, Chairman of the All-England Lawn Tennis Club and Chairman of the Crickfield Racing Association. In addition he held several Directorships in the City.

As well as his Deputy Ranger's House in Richmond, Park, he had a home in Flersp-

in his native Scotland, where he delighted in riding with his family in traditional Bay Membership of the Royal Yacht Squadron took him to visits to the family waters of the Mullion River, Scotland and the first one where he had sailed with the captain from Orleans on the gun. He was a keen shot and hunted with the Old Borkley.

He died peacefully in his sleep in his home in Richmond Park on March 1, 1951 at the age of 73.

Louis Georg was one of those fortunate and versatile people who, in the course of a long life, embarked on several different careers and made a success of all of them. In this respect he resembled that of Lord Baden Powell. As a school captain he marched with the Royal Marines in Flanders and served with the destroyers in the North Sea during the toughest years of the 1914-18 War. As a Royal Air Force doctor he learned to fly and transferred his full loyalty to his new Service. In World War II he was able to serve the RAF as a political aide and after 1945 he showed himself to be a skilled administrator in several civilian capacities.

In spite of all this I feel that perhaps his greatest achievement and the one nearest to his own heart was the number of young men whom he helped along the road to full medicalization. The fact that one of them was destined to become a King was only part of the story.

Acknowledgements

My grateful thanks are due to Mr. George Georg CVO for his permission to write this memoir of his father.

Also to The Controller Her Majesty's Stationery Office for permission to quote from Sir John George's Medical Journal. These items being Crown Copyright.

Also to Messrs Macmillan of London and Harpers for permission to quote extracts from King George IV: *My Life and Reign*, by Sir John Wheeler Bond.

Also to Miss Nona's Mother for a personal communication

Also to Admiral of the Fleet The Earl Mountbatten of Burma for a personal communication

Also to Mr C. T. Parsons Librarian Royal Naval Hospital Haslar for helpful

information and Associated Press Ltd for the photograph

References

- From *Army Glean* V1. Apr Feb and June by the Editor (Private Edition) 1 p 42 1 p 600 2 p 104 4 p 115 5 p 128 6 p 138 7 p 142 8 p 142 9 p 150 10 p 150

This system and procedure handling has published in *ISCT* and named as its subtopic, *System of Internal Control Systems and General Management*. Two researchers were charged with the responsibility of creating appropriate goals in accordance with this new system and the rest of the researchers.

In summary, while many other developments in ethno-ecology have developed on much more the cultural changes of the world than it is good to note how little the culture has changed in cases of being thought up to date ethnically by the present as ethnology as an present this article.

It would not be surprising to be identified as the work is a perhaps that is being addressed in the of culture distribution of the current and classical approaches of the past described in the conclusions and on a culture what is the most useful of the many natural science of ethno-ecology, to be, in, ethno-ecology.

Despite the lampyris genus status, the behavior of a wolf inevitably puts you back upon the condition recommended in the same medical school period production and therapy manual either as well security as a place in their knowledge.

Reproductive Behaviour. By R. N. Gilpin and T. L. Stone. Third edition. Pp. 344. + 16 illustrations and tables. Chichester: Wiley, 1989. £35.00.

There is one big factor that is very different in every school: the number of classes, subjects, or, in other words, the size of the school. The number of classes is the number of subjects that are taught in the school.

[illegible]

The authors also discuss in a separate section the sources and possible causes of the bias. They find that the students will have no opportunity of learning that by using these "unreliable" data sources (as we do).

There is a 30-year waiting list for this type of study, so it is clear that there is a great need for this type of research.

Editors: Dr. Kenneth W. Kinzler, Editor, and
 Patricia A. Kinzler, Editor, and
 Elizabeth A. Kinzler, Editor, and
 Elizabeth A. Kinzler, Editor, and

This book is a revised version of one by the same author published in 1943 under the name *How to Grow Your Own Food*. It is a revised edition of a book that was a success in its first edition.

© 2000 Blackwell Science Ltd, *Journal of Internal Medicine* 247: 399–406

the fact is, following the Russian War, the British Government was not prepared to finance the construction of a new railway line in the north-west of the country. The Government was not in a position to finance the construction of a new railway line in the north-west of the country. The Government was not in a position to finance the construction of a new railway line in the north-west of the country.

"Within the categories of 81 pages Dr. Hoffmeyer has described the issues of history and biology in the development and the development of human beings and its consequences in a highly unique, able manner. There are also chapters on the importance of the human environment and how it affects the intellectual development of children and a useful summary of other issues which are of interest and necessary importance. The chapters are of great quality and importance. However, this is

There is no causal connection between having a high level of education and being a victim of a crime, but the correlation is negative. This means that the more education a person has, the less likely they are to be a victim of a crime.

Metals and Chemistry in History and Culture. By J. T. Kupperman, MD. MSCP. 198 pp. + append. illustrated. The Heritage of Chemistry Materials. By W. H. Ross. MSc. Oxford: Blackwell, 1993. Pp. xx + 304. Nonesuch Trade and Leisure, distributed by Amazon, Ltd. 0-8203-1930-1. £29.95. 1993. 200 g.

[illegible]

Research is needed that assesses the long-term impact of the two programs linked only to certain frequent samples or to patterns suggesting that the presence of children and the various strategies for dealing with aggression both result in a total place in the educational curriculum of the primary school. First, there is a need for other studies aimed at drawing to the attention of teachers, students and parents very close to the classroom to follow the impact through a follow-up and system of feedback monitoring in practice on educational goals with priority as a result of a relevant research, and to assess the impact of the

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[illegible]

See also: [Cognitive Control Battery \(CCCB\) \(2012\)](#)
[Liu, L. \(2012\)](#) about this topic (11/10/12) on this page

Leahy's *Madison Square* was built in 1981 and entered the Smithsonian's *Design* and its *Decorative Arts* divisions along its acquisition in 1982. The *Madison Square* was the first work of art in the collection. Leahy's *Madison Square* was the first work of art in the collection. Leahy's *Madison Square* was the first work of art in the collection.

Marquis de Lafayette, who arrived in the port on August 15, 1777, to participate in the campaign with a French Armada of 110 ships, 20,000 men, 100 cannons, and 100,000 rounds of ammunition. The French Armada was the first to arrive in the port, and a fleet of 100 ships, 20,000 men, 100 cannons, and 100,000 rounds of ammunition, was the first to arrive in the port. The French Armada was the first to arrive in the port, and a fleet of 100 ships, 20,000 men, 100 cannons, and 100,000 rounds of ammunition, was the first to arrive in the port.

After leaving Davis for Royal Navy in 1942, he spent two months at general practice, as a demonstrator of anatomy at King's and Westminster. He moved to Bedford and Harrogate in 1943. He was elected to Westminster rural club in summer of 1952 and was its chairman and a magistrate from 1953 to 1964. He is married by his wife and daughter and has a son who is also a doctor.

Barbara Elaine Jones, nee BLEDGE, MS
B-1, B-2, B-3, B-4, B-5, B-6, B-7, B-8, B-9, B-10, B-11, B-12, B-13, B-14, B-15, B-16, B-17, B-18, B-19, B-20, B-21, B-22, B-23, B-24, B-25, B-26, B-27, B-28, B-29, B-30, B-31, B-32, B-33, B-34, B-35, B-36, B-37, B-38, B-39, B-40, B-41, B-42, B-43, B-44, B-45, B-46, B-47, B-48, B-49, B-50, B-51, B-52, B-53, B-54, B-55, B-56, B-57, B-58, B-59, B-60, B-61, B-62, B-63, B-64, B-65, B-66, B-67, B-68, B-69, B-70, B-71, B-72, B-73, B-74, B-75, B-76, B-77, B-78, B-79, B-80, B-81, B-82, B-83, B-84, B-85, B-86, B-87, B-88, B-89, B-90, B-91, B-92, B-93, B-94, B-95, B-96, B-97, B-98, B-99, B-100, B-101, B-102, B-103, B-104, B-105, B-106, B-107, B-108, B-109, B-110, B-111, B-112, B-113, B-114, B-115, B-116, B-117, B-118, B-119, B-120, B-121, B-122, B-123, B-124, B-125, B-126, B-127, B-128, B-129, B-130, B-131, B-132, B-133, B-134, B-135, B-136, B-137, B-138, B-139, B-140, B-141, B-142, B-143, B-144, B-145, B-146, B-147, B-148, B-149, B-150, B-151, B-152, B-153, B-154, B-155, B-156, B-157, B-158, B-159, B-160, B-161, B-162, B-163, B-164, B-165, B-166, B-167, B-168, B-169, B-170, B-171, B-172, B-173, B-174, B-175, B-176, B-177, B-178, B-179, B-180, B-181, B-182, B-183, B-184, B-185, B-186, B-187, B-188, B-189, B-190, B-191, B-192, B-193, B-194, B-195, B-196, B-197, B-198, B-199, B-200, B-201, B-202, B-203, B-204, B-205, B-206, B-207, B-208, B-209, B-210, B-211, B-212, B-213, B-214, B-215, B-216, B-217, B-218, B-219, B-220, B-221, B-222, B-223, B-224, B-225, B-226, B-227, B-228, B-229, B-230, B-231, B-232, B-233, B-234, B-235, B-236, B-237, B-238, B-239, B-240, B-241, B-242, B-243, B-244, B-245, B-246, B-247, B-248, B-249, B-250, B-251, B-252, B-253, B-254, B-255, B-256, B-257, B-258, B-259, B-260, B-261, B-262, B-263, B-264, B-265, B-266, B-267, B-268, B-269, B-270, B-271, B-272, B-273, B-274, B-275, B-276, B-277, B-278, B-279, B-280, B-281, B-282, B-283, B-284, B-285, B-286, B-287, B-288, B-289, B-290, B-291, B-292, B-293, B-294, B-295, B-296, B-297, B-298, B-299, B-300, B-301, B-302, B-303, B-304, B-305, B-306, B-307, B-308, B-309, B-310, B-311, B-312, B-313, B-314, B-315, B-316, B-317, B-318, B-319, B-320, B-321, B-322, B-323, B-324, B-325, B-326, B-327, B-328, B-329, B-330, B-331, B-332, B-333, B-334, B-335, B-336, B-337, B-338, B-339, B-340, B-341, B-342, B-343, B-344, B-345, B-346, B-347, B-348, B-349, B-350, B-351, B-352, B-353, B-354, B-355, B-356, B-357, B-358, B-359, B-360, B-361, B-362, B-363, B-364, B-365, B-366, B-367, B-368, B-369, B-370, B-371, B-372, B-373, B-374, B-375, B-376, B-377, B-378, B-379, B-380, B-381, B-382, B-383, B-384, B-385, B-386, B-387, B-388, B-389, B-390, B-391, B-392, B-393, B-394, B-395, B-396, B-397, B-398, B-399, B-400, B-401, B-402, B-403, B-404, B-405, B-406, B-407, B-408, B-409, B-410, B-411, B-412, B-413, B-414, B-415, B-416, B-417, B-418, B-419, B-420, B-421, B-422, B-423, B-424, B-425, B-426, B-427, B-428, B-429, B-430, B-431, B-432, B-433, B-434, B-435, B-436, B-437, B-438, B-439, B-440, B-441, B-442, B-443, B-444, B-445, B-446, B-447, B-448, B-449, B-450, B-451, B-452, B-453, B-454, B-455, B-456, B-457, B-458, B-459, B-460, B-461, B-462, B-463, B-464, B-465, B-466, B-467, B-468, B-469, B-470, B-471, B-472, B-473, B-474, B-475, B-476, B-477, B-478, B-479, B-480, B-481, B-482, B-483, B-484, B-485, B-486, B-487, B-488, B-489, B-490, B-491, B-492, B-493, B-494, B-495, B-496, B-497, B-498, B-499, B-500, B-501, B-502, B-503, B-504, B-505, B-506, B-507, B-508, B-509, B-510, B-511, B-512, B-513, B-514, B-515, B-516, B-517, B-518, B-519, B-520, B-521, B-522, B-523, B-524, B-525, B-526, B-527, B-528, B-529, B-530, B-531, B-532, B-533, B-534, B-535, B-536, B-537, B-538, B-539, B-540, B-541, B-542, B-543, B-544, B-545, B-546, B-547, B-548, B-549, B-550, B-551, B-552, B-553, B-554, B-555, B-556, B-557, B-558, B-559, B-560, B-561, B-562, B-563, B-564, B-565, B-566, B-567, B-568, B-569, B-570, B-571, B-572, B-573, B-574, B-575, B-576, B-577, B-578, B-579, B-580, B-581, B-582, B-583, B-584, B-585, B-586, B-587, B-588, B-589, B-590, B-591, B-592, B-593, B-594, B-595, B-596, B-597, B-598, B-599, B-600, B-601, B-602, B-603, B-604, B-605, B-606, B-607, B-608, B-609, B-610, B-611, B-612, B-613, B-614, B-615, B-616, B-617, B-618, B-619, B-620, B-621, B-622, B-623, B-624, B-625, B-626, B-627, B-628, B-629, B-630, B-631, B-632, B-633, B-634, B-635, B-636, B-637, B-638, B-639, B-640, B-641, B-642, B-643, B-644, B-645, B-646, B-647, B-648, B-649, B-650, B-651, B-652, B-653, B-654, B-655, B-656, B-657, B-658, B-659, B-660, B-661, B-662, B-663, B-664, B-665, B-666, B-667, B-668, B-669, B-670, B-671, B-672, B-673, B-674, B-675, B-676, B-677, B-678, B-679, B-680, B-681, B-682, B-683, B-684, B-685, B-686, B-687, B-688, B-689, B-690, B-691, B-692, B-693, B-694, B-695, B-696, B-697, B-698,

[illegible][illegible]

Stewart-Lee, *Chadwick*, *Marble* the covered the Royal National Theatre Theatre in a 1990s production.

Lieutenant (E) LLOYD, a railway fitter and transferred to the Portsmouth List on August 1940. He was promoted to Sergeant Captain 1st in April 1942 and was placed on the Royal List in December 1942.

After retirement from the Royal Corps for Medical attached service in Malaya where he was a founder member of the Royal Society Club and a keen supporter of the R.M.C.

¹ Georgia Commissioner (C); Harold Howard
Baker, LBB#C3189, died on April 23, 1973
at age 60, 65.

Harold Edward Ryan joined the Royal Naval Air Service in June 1917 and was commissioned in January 1918. He then attended the Royal College (Hospital) Coastal School and transferred in June 1920, entering the Royal Naval Air Service as a Marine Lieutenant (RN) in July 1921. He was promoted to Marine Lieutenant (RN) in 1924 and placed on the Reserve List in January 1926.

Sergeant Commander William WILLIAMS told that about 100 people (30, 40) at that age (20, 30).

Mr. and Mrs. George H. Brown, 1000 E. 12th St., Minneapolis, Minn., are the parents of a son, George H. Brown, born May 15, 1924, at Minneapolis, Minn. The father is a member of the American Legion, Post 1000, Minneapolis, Minn. The mother is a member of the Y. W. C. A., Minneapolis, Minn.

[illegible]

The late, long-lived Connecticut Wildlife Commission was born in Haddam, Maine, long before there was a city, let alone a town, in Connecticut. The commission has succeeded in greatly increasing the numbers of woodland birds nesting here. (See "Large" Nests) This summer, page 1 News discovered it that the war songbirds in Haddam had started their songbirds of long ago in 1929 and in their day, under circumstances that are very part of the conditions of the Old World. But

What is being done that Royal Navy has to remain in the family home in Southampton? The war cabinet accepted it is the Ministry of Transport, the civil branch of the Royal Naval Establishment, said it was worried the war on submarines was being a great factor of the Southampton General Strike.

1999 is considered the first year of the 21st century and is thus a good starting point.





The Riverside Middle School building, built in 1937. This was one of the first of the new schools built in the city of Los Angeles. The building was destroyed by fire on October 11, 1941, and the present building was built on the same site in 1942.

EDITORIAL

The Report of the Defence Medical Services Inquiry Committee, familiarly known to us all as 'The Jarrid', has now been delivered after a fairly protracted period of gestation and a troublesome labour surely due to a very prolonged and difficult third stage. Up to the last minute there was some doubt as to when the new arrival would be able to appear in public, but now that it has at last done so we are all congratulating the parents on their healthy offspring (with the usual mental reservation that it was quite a world-shaking to the parents' think).

In fact the Navy, in case of all its problems — very little family size, isolated conditions of service and the need to work in strange circumstances — comes very well out of the whole study. One difficulty was obviously appreciated as one can often see overcome them, and the recommendations, more regarding hospitals, clearly recognise that in this field no real progress can be looked at us. In fact it is proposed that some of our hospital ship-lying should be brought forward to facilitate the introduction of auxiliary.

The definite stress on the need for more training hospital accommodation further recommends closer liaison with the NHS and an increased intake of patients (with a hospital-for financial adjustment was to be anticipated and is welcomed). It is hoped that this emphasis may have the effect of reducing the current shortage of man-power, which is the only reason why many of these recommendations have not been subsequently adopted in the past. In particular the suggestion for a greater awareness of the need for accurate coverage

is welcomed. As a case of increasing importance a refinement of the use of health care is essential if help are to be made of our limited resources and doctors' time usually tied in damaged such sensitive thoughts.

It is of interest that the largest chapter in the Report, revolving in the greatest number of recommendations, is devoted solely to improving the lot of the nursing services — not an area in which the Navy faces its greatest difficulties, and certainly not one in which our remaining problems are great, probably for reasons connected with professional work. Nevertheless as a result of our different approach to the status of the Nursing Service it has become an area which does give rise to a certain amount of controversy. Hospital suggestions may make to improve the position of the medical technician employed in nursing duties, but it is hoped that nothing will arise from the Report which could change the traditional position of Queen's Nurse under a Royal Naval Nursing Service. With our naval rank or disciplinary power this Service manages its patients with an efficiency which would delight Florence Nightingale, and so interferes with the tradition on which such a happy and capable Service has been built could be very dangerous.

Above all the wisdom and foresight of the Committee is shown by various suggestions for changes in the organisation which will undoubtedly lead to greater co-ordination, but which culminate in the recommendation (76) — 'The Defence Medical Services should not be centrally acted

FATAL PNEUMOCOCCAL MENINGITIS IN ADULTS FOLLOWING SPLENECTOMY— TWO CASE REPORTS AND A REVIEW OF THE LITERATURE

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SUMMARY

Two fatal cases of pneumococcal meningitis occurring in adults who had undergone splenectomy several years previously are described, and the literature relating to pneumococcal sepsis in asplenic patients is reviewed. There is a specific predisposition to pneumococcal sepsis. Asplenic patients presenting with the Weill-Rosenfeld syndrome have a high mortality, but those presenting with meningitis or septicaemia have a similar mortality to normal people. Patients undergoing splenectomy for the staging of Hodgkin's disease may run a greater risk of serious sepsis than asplenic patients in general. There is no evidence that the risk is greatest during the first 3 years following splenectomy. The prophylaxis and management of infection in asplenic patients are discussed. It is possible that knowledge of the problems in the asplenic patient may reduce the mortality.

Definitions

Kahnman and Sargant (1960) define serious sepsis as life-threatening or fatal septicaemia or bacterial meningitis and these criteria are used in the present review. Asplenic had hypoplasia or absolute congenital absence of the spleen or atrophy of the spleen and surgical removal.

Introduction

Since King and Schramm (1912) drew attention to the possible risk of serious infection following splenectomy in adults

severe attacks have appeared in the literature concerning post-splenectomy infections in adults and children suffered by Erdos, Burger and Lynn (1963). Such infants under one year of age were thought to have an increased incidence of post-splenectomy infection while older children had a normal incidence of infection but a devastating mortality of 75 per cent (Erdos *et al.* 1963). Of the cases in which an organism was isolated *Streptococcus pneumoniae* was recovered from approximately 50 per cent of cases, *Neisseria meningitidis*, *Haemophilus influenzae* and *Escherichia coli* being responsible for the remainder.

Serious sepsis following splenectomy has been stated to occur more frequently when the underlying disease process predisposes to infection (Lawden, Stewart and Wilkie 1964) and approximately 80 per cent of the cases of serious infection are stated to occur within two years of splenectomy (Smith, Patterson, Schuman and Sam 1957; Howe, Goldbach 1967). There are reports of patients suffering from recurrent pneumococcal infections following splenectomy (Kahnman and Sargant 1960; Howe and Goldbach 1967; Lawden, Wilkie and Wilkie 1962; Wharton 1969).

Wharton (1969) suggested that post-splenectomy infection was not confined to children when he described eight cases of pneumococcal sepsis in asplenic patients their ages ranging from 12 years to 71 years. Five of the patients died and the

Infamous trial course of the disease was altered. Four of these had features pathognomonic of disseminated intravascular coagulation, and two had features typical of the Wernicke-Friderichsen syndrome. Whicker concluded that epidemic neonatal had a peculiar susceptibility to perinatal coagulopathy and that the role did not encompass epinephrine.

Revised status at the outbreak of post-epinephrine infection has followed the introduction of epinephrine and epinephrine in the therapy of Hodgkin's disease (Stevens, Warner, Knudsen and Holtzoff 1972; Nixon and Aumay, 1972; Gifford, Gifford and Morgan 1972; Donaldson, Wilson, Rosenburg and Yoon 1972; Nixon, Hall, Jones, Rosenburg and Kaplan 1972; Barry, Mulholland, Viter-Carson, Montalvo and Santiago 1972). Through the majority of the reported cases of apnea occurred in older children and adults, the conclusions and recommendations were based on data from the pediatric literature.

The authors' interest was drawn to the problem of post-epinephrine apnea by a case of fetal perinatal coagulopathy in a young man who had undergone epinephrine for glaucoma therapy (epinephrine per part three years previously). A stroke case was recalled from the hospital records. On examining the literature, the authors found only 14 cases of various perinatal coagulopathy occurring in epidemic patients aged 12 years or older. It was his work which presented these two new cases and revised the relevant literature.

Case Reports

Case 1 The patient is a 14-year-old male, almost constant, arriving in the Royal Navy was admitted to the hospital in October 1959 following a blow to his left lower chest and hyperextension while playing football. There was no history of significant

past illness. At laparotomy a ruptured spleen was removed and his post-operative recovery was unremarkable. The spleen was not examined histologically. He remained well until January 1960 when, aged 11, he was admitted with a clinical diagnosis of influenza. During that day he suffered from a mild sore throat, a non-productive cough, a frontal headache and feeling on both legs. Examination revealed a general young man (temperature 38.5 °C) with no apparent pharynx and no other abnormality. The epinephrine was noted, and the absence of lymphadenopathy and neck swelling was specifically recorded.

He was observed in a low dependency ward with only symptomatic treatment. He felt better the following day but remained pyrexial (temperature 38.5 °C). On the third day he was apnoeic and complained only of mild generalized itching of type of a reported whole cell count of 17,400/mm³ with 51 per cent polymorphs. However, the following morning he complained of severe headache, vomiting and became confused. On examination he was again pyrexial and sweating profusely, but obvious signs of meningitis, but had no local neurological signs. He was very restless, ignored spoken commands, and his mental state was first noted as unresponsive. Seizures with 300ms of sodium phenobarbitone was required before further pointers could be attempted. While this was being carried out, another apnoeic had proved difficult to obtain the patient died suddenly and examination proved satisfactory.

At autopsy the meninges were slightly inflamed with perivascular cerebral oedema and in the sulci of the superior surface of the brain and cerebellum of grey pus on the inferior surface of the cerebellum. The brain was unremarkable with oedema of the cerebral cortex but was macroscopically normal on including hippocampal pressure was collected from the post. The lungs revealed no evi-

death of pneumonia and the adrenals were macroscopically normal apart from slight cortical lipid depletion. The cause of death was limited to the acute pneumococcal meningitis of unusually rapid development. **Case 3.** The patient, a male radio operator serving in the Royal Navy, was investigated at this hospital in 1949, aged 22 years and diagnosed as suffering from idiopathic thrombocytopenic purpura. The thrombocytopenia responded to steroid therapy, but the patient developed a severe psychosis necessitating withdrawal of the steroids. His thrombocytopenia relapsed and splenectomy was performed in June 1950, five months after his initial presentation. His platelet count rapidly returned to normal levels. Histology of the spleen revealed large reactive germinal centres in the Malpighian bodies with congestion and dilation of the sinusoids. There was no evidence of abnormality. The appearances were consistent with a diagnosis of idiopathic thrombocytopenic purpura.

The patient was observed as an inpatient for nine months during which time he remained well with a normal platelet count. Following discharge from follow-up he remained completely well until February 1952 when aged 26 years he was admitted with a difficult history of asthmatic and general aching and a 24 hour history of generalized abdominal pain with three episodes of vomiting. On admission vomiting, mild headache and diarrhoea were for that day.

Examination revealed a flushed general appearance (37.7°C), glaucous conjunctivae and white watery delayed capillary refill. Heart rate 110/60. His lungs were clear and palatal petechiae were present. He had nodes slightly tender on lateral lymph nodes in the neck, axilla and groin, and his liver could be palpated two inches below the costal margin, being tender to palpation. Apart from the hepato-

megaly, examination was otherwise normal. He was reported to have a white cell count of 17,800/mm³, but a differential count was not performed. Asypical monocytes were present in the blood film and the monospot test was positive. The platelet count was 125,000/mm³. A date diagnosis of idiopathic thrombocytopenia was made and he was admitted to a general medical ward.

The following morning he was afebrile, feeling well, but was otherwise unwell. Abdominal pain and vomiting had ceased and he had taken breakfast. Physical examination confirmed the findings of the previous evening. A repeat blood count revealed a white cell count of 12,500/mm³ with 75 per cent neutrophils and some promyelocytes in the polymorphs. Twenty-four hours after admission he complained of severe headache which he noted had been present for 48 hours. His temperature was 37.5°C and examination of his central nervous system was unremarkable with no evidence of neck stiffness and a negative Kernig's sign. He was re-examined four hours and on being later because of his persistent headache. On the fifth morning night restlessness was noted with a temperature Kernig's sign and his temperature was 38.8°C. The physicians considered that there was considerable 'overkill' and prescribed diazepam 10 mg.

Eight hours later he was found to be unresponsive to substantial respiratory stimulation by nasal cannula. His temperature was 40°C and he had extensor-neck rigidity. His right pupil was fixed and dilated, his limbs flaccid with clonus tendon reflexes and the plantar reflexes flexor. Lumbar puncture revealed turbid cerebrospinal fluid containing 120 polymorphs/mm³, protein 12 g per cent, glucose 4 mg per cent. Bacteriological examination was cultured from the cerebrospinal fluid and blood. Treatment with penicillin and methylprednisolone was

total leukocytosis and dexamethasone failed to halt the deterioration in the patient's condition. Within 27 hours of his first complaint of severe headache he was totally unresponsive with both pupils fixed and dilated and with shallow or infrequent respiration necessitating intermittent positive pressure respiration. He survived with respiratory support for 30 days but as no trace showed evidence of neurologic improvement. He became apneal within 24 hours of starting treatment and his cerebral spinal fluid was sterile within 48 hours. The haemoglobin fell from 14.7 g per cent to 11.0 g per cent during the first 24 hours, and then to 9.8 g per cent by the eighth day of his illness. Clinically there was no bleeding tendency but laboratory studies to demonstrate disseminated intravascular coagulation were not performed. Renal function was normal throughout.

At autopsy there was no evidence of purpura, either intracerebral or cutaneous. The meninges were thickened and inflamed and patches of purple pus were present on the surface of the brain. The surface of the brain was subnormal and soft with red-brown discoloration; the vasculature in the bulk of a 'dead' brain that had been resuscitated by artificial ventilation. Focal haemorrhages were present in the pons, but there was no evidence of meningeal inflammation. The cerebral and cerebellar sulci contained both layers had the red hyperemic appearance of later meninges in all lobes and medulla with red 2400 μ . The meninges were inflamed but the subarachnoid space was grossly sterile.

Histology showed that the subarachnoid space contained a thick, dense rich mass in which large numbers of macrophages and fewer polymorphs were present. The large vessels contained an almost total block of erythrocytes. Other vessels were occluded by perivascular and the two obtained at autopsy was sterile. The subarachnoid space

no evidence of cerebral haemorrhage. Sections of the brain, lungs, liver, kidney and placenta contained no microorganisms. These describe the cause of death was recorded as acute perimenstrual meningitis.

Comment on Case

During the last 72 hours of illness the first patient was examined by two doctors and the second patient by five doctors, none of whom suspected that the patients were seriously ill. The fact that the second patient had a previous meningitis probably misled suspicion. This work was not checked during the patient's illness. However both patients had small total white cell counts with leukopenia suggesting a total cell rejection from the onset of their disease. The meninges obtained from the first patient having symptoms suggestive of meningitis as his death was at most eight hours and was probably only four hours. The second patient had a period of 17 hours between his initial combined symptoms of meningeal and the onset of obviously obvious irreversible neurological disease. He would have died then without artificial ventilation. Neither patient had clinical evidence of a bleeding tendency during their final illness. However macrovascular evidence of disseminated intravascular coagulation was not sought for in the tissues of the first patient, and although macrovascular thrombosis was the cause of the second the evidence was most unlikely to have been present 30 days after the onset of onset. The medical records of both patients contained no details of periods of infection occurring in the interval between admission and the final fatal illness.

Review

On reviewing the literature it becomes apparent that most of the published cases of subarachnoid meningitis after spontaneous occurred in children and very few reports

unaffected adults. Infrequently defined by the authors as patients aged 12 years and over. Thirty-eight cases of various parasitic oesophageal types in splenic cysts have been found in the literature, and these with the authors' case series are presented in Table 1.

Role of the Spleen

Before detailed discussion of these cases the role of the spleen is generalized in human worms considered. It has been shown (Blanchard, Rosenberg, and Kryn 1966; Whitaker 1968) that splenotomized

TABLE 1

Author	Age	Sex	Parasites and Splenectomy	Interval between Splenectomy and Infection	Type of Splenic Cyst	Outcome	Duration of Illness
Pearl et al (1939)	14	F	Ascariasis	—	W-P	Dead	27 years
Whitaker & Reilly (1950)	46	M	Ascariasis	—	W-P	M	—
Whitaker et al (1952)	76	F	Monosymptomatic	1 month	M	—	—
Whitaker (1959)	12	F	1 T F	4 years	M	Recovery	—
Cameron et al (1959)	12	F	1 T F	4 years	M	Dead	—
Whitaker & Whitaker (1960)	15	F	Parasitosis A	—	S	Dead	12 years
Whitaker et al (1961)	15	M	1 T F	4 years	W-P	Dead	24 years
Whitaker & Whitaker (1962)	17	F	Parasitosis	14 years	W-P	Dead	24 years
			(Parasitosis A)				
Smith et al (1962)	32	M	Trichostrongylus	8 years	S	Dead	18 years
Craig et al (1962)	18	F	Trichostrongylus	1 month	W-P	Dead	74 years
Craig (1963)	15	M	Trichostrongylus	1 year	W-P	Dead	14 years
C.F.C. (1964)	16	F	Polysymptomatic	3 months	W-P	Dead	27 years
Whitaker & W.D. (1966)	46	F	Trichostrongylus	1 month	W-P	Dead	54 years
Whitaker et al (1966)	70	F	Parasitosis A	1 year	W-P	Dead	44 years
Whitaker et al (1966)	70	F	Trich. Strongylus	1 year	M	Recovery	—
Whitaker et al (1966)	70	F	1 T F	1 year	M	Dead	—
Whitaker (1966)	21	F	Parasitosis	7 years	W-P	Dead	26 years
			(Parasitosis A)				
Whitaker (1966)	61	F	Ascariasis	—	W-P	Dead	39 years
Whitaker (1966)	59	F	1 T F	14 years	W-P	Dead	29 years
Whitaker (1966)	71	M	Parasitosis	4 years	W-P	Dead	4 days
			(Parasitosis A)				
Whitaker (1966)	57	M	Trichostrongylus	1 year	W-P	Dead	—
Whitaker (1966)	58	M	Trichostrongylus	5 years	M	Recovery	—
Whitaker (1966)	71	M	Trichostrongylus	6 years	M	Dead	—
Whitaker (1966)	59	M	Trichostrongylus	10 years	S	Recovery	—
Whitaker (1966)	53	F	Trichostrongylus	2 years	S	Recovery	—
W.D. & Whitaker (1966)	45	F	Ascariasis	—	W-P	Dead	24 years
Collier et al (1972)	—	—	Ascariasis	1 year	M	Recovery	—
Collier et al (1972)	—	—	Trichostrongylus	1 month	M	Recovery	—
Collier et al (1972)	—	—	Trichostrongylus	1 year	S	Recovery	—
Collier et al (1972)	—	—	Trichostrongylus	1 year	S	Recovery	—
Smith et al (1972)	41	M	Trichostrongylus	2 years	W-P	Dead	36 years
Kelly et al (1972)	44	F	Trichostrongylus	1 year	M	Recovery	—
Whitaker et al (1972)	54	F	Trichostrongylus	1 year	S	Recovery	—
Whitaker et al (1972)	59	F	Trichostrongylus	1 year	S	Recovery	—
Whitaker et al (1972)	21	M	Trichostrongylus	1 year	S	Dead	—
Whitaker et al (1972)	51	M	Trichostrongylus	1 year	S	Recovery	—
Whitaker et al (1972)	51	M	Trichostrongylus	1 year	S	Recovery	—
Whitaker (1972)	54	M	Trichostrongylus	1 year	W-P	Recovery	—
Present Case 1	26	M	Trichostrongylus	1 year	M	Dead	75 years
Present Case 2	26	M	1 T F	1 year	W-P	Dead	17 days

W-P Whitaker's Polysymptomatic syndrome.
M Monosymptomatic.
S Symptomatic.
1 T F Trichostrongylus, Trichostrongylus, Pin 1 and 2.
Recovery Recovery.

in *v. v.*, since susceptibility is in complete agreement with splenectomy by the previous course of the incubation was reported intravenously but not if injected subcutaneously. In the splenectomized mouse, the concentration of organisms after intravenous administration remained higher in the blood than in any other organ or even the disseminated viscera. In contrast, the highest concentration of organisms in the non-splenectomized mouse was found in the spleen. It was also noticed that the concentration of organisms in the blood of the splenectomized mouse mirrored with the passage of time, while the concentration in the blood of the normal litter. Although the deleterious effects of splenectomy did not disappear with time, the susceptibility to paramucocoral sepsis was greater in these mice splenectomized at late months of age than those splenectomized at five months of age. This correlation with the published human data, the risk of serious sepsis being greater when splenectomy is performed in the first six months of life.

The spleen is not thought to have a significant bacterial effect on bacterial infection. The phlebotic levels in splenectomized patients being reported as normal (Blair *et al.* 1957). Feltus (1948) showed that five per cent of normal non-splenectomized humans failed to respond immunologically to paramucocoral antigen. Levine, Rose and Wolf (1959) found that only 55 per cent of splenectomized patients failed to respond immunologically when immunized with tuberculin vaccine, when patients with chronic lymphatic leukaemia were excluded on the ground that they were known to be poor antibody formers. The main function of the spleen in this context would appear to be that of a filter, trapping encapsulated organisms and preventing their blood concentration from rising to the levels associated with massive bacteraemia and disseminated intravascular coagulation (Lancet and River 1962).

Incidence of Post-Splenectomy Paramucocoral Sepsis

These splenectomized children are probably susceptible to paramucocoral infection but clearly have contracted but this does not necessarily apply to the adult. It was thought that in 17 of the reported cases of paramucocoral infection in splenectomized patients with the distinctive clinical picture of the Waterhouse-Friderichsen syndrome that could have resulted in over emphasis of the importance of the paramucocoral in adult post-splenectomy infection. The authors examined 10 adult cases of severe post-splenectomy infection from the series reported by Lowdon *et al.* (1964), Gattuso *et al.* (1977), Bann *et al.* (1977) and Carpenter, Wainwright, Fuller, Hain and Carrington (1979) as these authors are likely to have included all cases of serious infection following splenectomy in their patients and not only paramucocoral infection. Of the 10 cases the paramucocoral was responsible for nine.

Whitaker (1969) made a retrospective study of 480 cases of sepsis in four hospitals including 77 cases of paramucocoral sepsis. Splenoma was found in eight of the 77 cases of paramucocoral sepsis, in one of the 139 cases with non-paramucocoral bacterial sepsis and in none of the 164 cases of aseptic meningitis. The concentration of sepsis and paramucocoral cases was statistically significant ($P=0.001$). Thus splenectomized adults would also appear to have a specific predisposition to paramucocoral infection.

Waterhouse-Friderichsen Syndrome

The Waterhouse-Friderichsen syndrome is only rarely associated with paramucocoral infection in normal people (Whitaker 1969) but of the 10 adult cases of Waterhouse-Friderichsen syndrome occurring with paramucocoral infection quoted in Whitaker's paper nine are stated to have hypoadrenalism. Rose and Freeman

(1970) add a further three cases of post-operative splenic rupture following splenectomy in the Waterhouse-Friderichsen syndrome. This correlates with the previously quoted experimental evidence that the spleen prevents the peritoneocolic bacteria reaching the level resulting in disseminated intravascular coagulation. Surprisingly Waterhouse-Friderichsen syndrome due to meningococcal infection is rarely seen in splenectomized patients (Wheatley 1966). Thus it is well established that the typical presentation of peritoneocolic sepsis is characteristic of the splenic state and in the absence of splenic injury, sepsis of this type or atrophy of the spleen is extremely likely.

Prognosis

The prognosis of splenic patients suffering from peritoneocolic sepsis is related to the type of illness. Of the 17 adult cases of peritoneocolic sepsis presenting as the Waterhouse-Friderichsen syndrome 11 died and seven of these died within 24 hours of presentation. Yet of the 10 cases presenting with meningitis only two died and of the 11 cases presenting with septicæmia three died. These latter figures are similar to those published by Michien (1972). Of the 208 consecutive cases of peritoneocolic meningitis that he investigated 58 per cent presented in severe shock or coma and 24 per cent died usually within 24-48 hours. The very best case, of peritoneocolic meningitis presented by the authors are thought to have appeared before. Both patients had profound ill health lasting 72 hours that was of mild onset merely to natural ulcers in hospital but that could not be considered as serious. Repeated examinations listed in several signs of meningitis. When the signs of meningitis did appear the doctors present were so concerned that it is doubtful whether any treatment would have been effective.

It is interesting to note that of the 12 cases of peritoneocolic sepsis occurring in splenectomized Hodgkin's patients 10 survived including one patient with the Waterhouse-Friderichsen syndrome. This group of patients are likely to have been severely improved by their medical attempts and any evidence of sepsis would have resulted in early vigorous therapy. This may suggest that knowledge of the risk may reduce the mortality. It would appear that peritoneocolic meningitis or septicæmia occurring in splenic patients is not associated with an elevated mortality when compared to that of normal people. However, splenic patients presenting with the Waterhouse-Friderichsen syndrome are very likely to have a fatal outcome and this group constitutes approximately 44 per cent of all the cases of peritoneocolic sepsis shown in Table 1. It is thought that the true incidence of this syndrome is considerably less than suggested by these figures due to the number of deaths in two case reports in the literature (Strom *et al* 1972; Stone and Freeman 1970; Parr Shapiro and Holland 1970; Myerson and Koelle 1966; Cole 1963; Karsimon 1966).

Age Distribution

The age distribution of the adult cases of peritoneocolic sepsis included in Table 1 is shown in Table 2. It would appear that the risk of peritoneocolic sepsis is greatest under the age of 20 years and that the risk remains fairly constant until middle age. This is consistent with the as-

TABLE 1

AGE RANGE	NUMBER OF CASES
10-19	11
20-29	9
30-39	9
40-49	4
50-59	5
60-69	1
70-79	1
80	0

and infection, concerning Hodgkin's disease. Splenectomized patients under the age of 15 years have been singled out as being particularly at risk (Editorial, *Annals of Internal Medicine*, 1972) and caution is forthcoming splenectomy in young patients has been advocated (Nixon and Asanberg, 1972). However, of the 34 adult cases of spleen shown in Table 2 approximately 40 per cent occurred after the age of 20 years.

Post-Splenectomy Time Interval

It has been stated that infection usually occurs within 3-5 years of splenectomy (Harvey *et al.* 1972, *Editorial, Annals of Internal Medicine*, 1972) but the data are based on the paediatric literature. Also many of the published post-splenectomy cases include patients who have been followed up for a maximum of two to three years. Horie and Chikamori (1963) state that the true incidence of late infection must be higher than appears from the published data. As the time interval between splenectomy and infection is of importance in prognosis when considering the management of post-splenectomy patients, this fact has been examined in the published cases of post-splenectomized spleen. Of the cases in Table 1 shown with complete absence or resection of the spleen were excluded as were those cases in which the length of follow-up was limited to less than three years (cases of Landon *et al.* 1966, Nasser *et al.* 1972, Collins *et al.* 1972, Donaldson *et al.* 1972, and Harvey *et al.* 1972). Of the remaining cases in which the post-splenectomy period is known, 14 cases of spleen occurred more than two years after splenectomy (78 per cent) and eight cases more than five years after splenectomy (46 per cent). Although the numbers are small, they clearly do not support the belief that the risk of spleen is greatly reduced when two years have elapsed after splenectomy. It remains to be proven that the risk of

infectious infection does not remain constant throughout life after splenectomy.

Influence of Underlying Disease

The possible relationship between the underlying disease process necessitating splenectomy and the subsequent development of severe sepsis has interested many authors. Smith, Gray, Diamond and Gross (1967) state unequivocally that if the asplenic spleen is removed because of local trauma, subsequent sepsis does not occur. However, of the 48 cases in Table 1 the indication for splenectomy in five cases was trauma. Pedersen and Voldheim (1966) followed up 49 patients splenectomized for trauma for an average period of 20 years and found no cases of life-threatening sepsis. Thus although splenectomy for traumatic rupture of the spleen does not appear to predispose to subsequent severe sepsis, specific cases in which the disease process appears to have been modified do occur.

At the other extreme it is frequently recognized that young children who undergo splenectomy for such diseases as Thalassemia, Wiskott-Aldrich syndrome, Gaucher's disease and partial hyponetosis have a definitely increased susceptibility to sub-sequent life-threatening sepsis and this predisposition is blamed on the underlying disease process (Lundin *et al.* 1966, Smith *et al.* 1967). The risk in patients undergoing splenectomy during the treatment of classical haemochromatosis, porphyria and hereditary spherocytosis appears to fall somewhere between these two groups.

In recent years splenectomy has become a routine in many centres in the staging of patients with Hodgkin's disease (Harvey *et al.* 1972) caution against the indiscriminate use of splenectomy (Nixon and Asanberg, 1972) advice that the benefits of splenectomy should be balanced against the possible risk of subsequent infection (Johnson, 1971) concludes that when

splenectomy is unlikely to show the best mean prognosis it should not be performed. An editorial (*Annals of Internal Medicine*, 1973) states that there is a group of patients aged under 15 years and suffering from nodular splenosis Hodgkin's who are unlikely to derive additional benefit from splenectomy and in whom the risk of subsequent infection may make one hesitant to perform a diagnostic splenectomy.

This conservative attitude may result from the fact that staging splenectomy is a recent innovation the place of which has still to be established (Johnson, 1973). However it may imply that the incidence of serious sepsis following splenectomy for Hodgkin's disease is unacceptably high and by inference more frequent than following splenectomy for other reasons. A comparison of the risk of serious sepsis in post-splenectomy Hodgkin's patients and in splenic patients suffering from other diseases was made by Donaldson *et al.* (1972) and an editorial (*Annals of Internal Medicine*, 1972). The editorial quoted the figures of splenic non-Hodgkin's patients in the reports of Fathly *et al.* (1967), Horan and Colchuck (1962) and Donaldson *et al.* (1972) and used these patients as a control group. It concluded that the morbidity and mortality in splenic Hodgkin's patients was significantly less than in splenic patients suffering from diseases other than Hodgkin's. The figures were admitted to be inadequate and the conclusion is of doubtful validity for other reasons.

The editorial states that the papers of Horan and Colchuck quote an incidence of 12 per cent for post-splenectomy serious sepsis in non-Hodgkin's patients. However if the orders of Robinson and Margison (1968) are applied the incidence of serious sepsis is reduced to 7.6 per cent. Also, the series of Horan and Colchuck was mainly concerned with infants and children. Only 22 of the 142 cases of splenectomy were

aged 12 years and older and in seven of these there was an underlying disease predisposing to sepsis. Infection in post-splenectomy children of the total 142 cases of underlying disease present was present in 31. The paper of Fathly *et al.* was solely concerned with infants and children and a review sepsis was virtually confined to persons suffering from an underlying disease process that is known to predispose to infection.

The authors doubt whether the incidence of post-splenectomy serious sepsis in infants and children many of whom were suffering from diseases known to predispose to infection in the non-splenectomized child can validly be compared with the incidence of serious sepsis in older children and adults suffering from Hodgkin's disease, the early nature of which is rarely complicated by significant infection. Kinnear *et al.* (1961) this study of Donaldson *et al.* (1972) can be criticised on the grounds that information relating to the ages of their patients was incomplete, and more important that an unknown number of their non-Hodgkin's patients were receiving immunosuppressive therapy following renal transplantation.

The study of Landon *et al.* (1984) reported the incidence of serious sepsis in all patients undergoing splenectomy at Harland and Waker in 1981. Patients of all ages and with numerous types of underlying disorder were studied and satisfactory follow up information at two to three years was obtained for 96 per cent of patients. Although a three year follow up is far from ideal the authors already stated that period readily enables the follow-up period of the Hodgkin's patients quoted in the reports of Natta and Auramborg (1973), Griffith *et al.* (1972), Donaldson *et al.* (1972), Moore *et al.* (1972) and Perry *et al.* (1972) and the two groups are compared in Table 3. There may be an over-representation of Hodgkin's patients in the total quoted by Landon, but as staging splenectomy has

a controlled trial of prophylaxis, using such an antibiotic (possibly unspecified), has been performed. The role of antibiotic prophylaxis remains in doubt, especially if used only for a period of two years.

Smith *et al.* (1962) suggested the possibility of preventing sepsis, pneumonia by substituting them with a polytetrafluoroethylene vaccine, and this suggestion has recently been put forward again by Levin (1971). The question whether penicillin prophylaxis for a period of two years is the optimal choice of therapy and whether this vaccination with a polytetrafluoroethylene might be more efficacious. However, Ammann (1972) quotes a case of a splenectomized patient suffering from *Streptococcus faecalis* who recovered from pneumococcal sepsis, has failed to respond immunologically to any different pneumococcal polysaccharide. Thus, a controlled clinical trial is needed not using a polytetrafluoroethylene pneumococcal vaccine as suggested by Steinwandel (1972). The efficacy of this type of prophylaxis remains uncertain.

The authors have noticed that the past few, rarely mentioned the source of the aetiology organisms. These two cases had no history of surgery or medical ear infection and had no recent dental treatment. Three cases of severe pneumococcal sepsis occur may in aplastic patients following dental treatment are quoted in the literature (Levin *et al.* 1962; Cole 1963; Clinico-pathological conference, *American Journal of Medicine*, 1964). The susceptibility of the relationship of pneumococcal sepsis in aplastic patients to the morphological changes of capsulated pneumococci and to recent dental treatment might prove worth while.

Management of Sepsis

The management of the aplastic patient with evidence of sepsis by the Walter Reade Foundation syndrome, as well

established, and require full dosage of an effective antibiotic (penicillin and chloramphenicol) in full dosage until the causative organism is identified, tetracyclines, cephalosporins (Wardlaw-Friedrichsen syndrome), and general supportive measures. A problem arises when an aplastic patient presents with a pyrexia of unknown origin, as this may develop into a fulminant illness. A blood count should be performed and if a polymorphonuclear leucopenia is present blood cultures should be taken and treatment with antibiotics started. If this course of action had been followed in the authors two cases the outcome might have been more favourable.

It is apparent from the literature that occasional aplastic patients will be beyond medical help or arrived at hospital (Storer *et al.* 1952; Stone and Freeman, 1959). The only way to avoid such results is the absence of proven effective prophylaxis in the case of every aplastic patient for three periods of the usual but definite risk and for every medical practitioner to have a high index of suspicion when dealing with such patients.

Acknowledgements

The authors are indebted to Surgeon Captain P. Proctor, Royal Navy Officer of Naval Medicine and Surgeon Captain D. Haines, Royal Navy Officer of Pathology for their continued interest in this paper and constructive criticism.

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A CASE OF PHAEOCHROMOCYTOMA

by C. I. Durr

ABSTRACT

A case of pheochromocytoma, diagnosed in a 39-year-old male following the discovery of hypertension during routine examination is described. Following the demonstration of abnormally high urinary levels of catecholamines and their meta metabolites, the presence of a right suprarenal tumour was demonstrated by ultrasonic scanning and confirmed by radiography. After removal of the pheochromocytoma the blood pressure fell to within normal limits.

Introduction

Pheochromocytoma is a rare cause of hypertension according to perhaps 0.4-0.8 per cent of hypertensive subjects (Oliver 1966). The tumour exerts its effects by the secretion of the pharma-cologically active catecholamine *adrenaline* and to a much lesser *adrenaline* also. The majority arise in the adrenal medulla but approximately 18 per cent are found in chromaffin tissue elsewhere (Patterson and Gelland 1957).

The relative secretion rates of *adrenaline* and *noradrenaline* are of more than academic importance. Harrison, Burdett and Sisson (1961) emphasized the clinical value of determining their relative secretion levels by assessment of the catecholamine state and decrease on treatment of patients with *adrenaline* receptor blocking agents. In function of the tumour increased *adrenaline* production suggests that the tumour is adrenal while the majority of extra-adrenal tumours secrete mainly *noradrenaline*. This is not invariably true (Brown 1972).

The clinical features vary. *Paroxysmal* may be at paroxysmal attacks of hypertension accompanied by sweating, palpitations, headache, tachycardia, nausea and vomiting, facial pallor occasionally followed by flushing in the later stages of the paroxysm, pain and numbness of the legs, tingling and numbness of the feet (Krebs, Roth, Meyer and Privoley, 1957). Such patients may be normotensive between attacks. However some cases present with persistently elevated arterial pressure with or without or no paroxysmal features (Krebs *et al.* 1957; Hume 1966).

Paroxysmal hypertension may be the only abnormality of arterial pressure detected in some such cases the tumours secrete predominantly *adrenaline* (Kushner and Frost 1961; Miller 1961) but this is not invariable (Rumay and Longmire 1961).

The incidence may be limited, 29 cases having been recorded in 78 families. There is also an increased incidence of *adrenaline* tumours in twinning cases (Barlow, Goodson and Fowles 1962). Association with von Recklinghausen's neurofibromatosis (Hendler and Melchior 1959) medullary thyroid carcinoma and parathyroid tumours have been reported (Reiser *et al.* 1961; Siegel 1961).

Despite the symptoms and physical signs may be few and variable, the diagnosis may present difficulties if the levels of pheochromocytoma is not known (Richards, Adams and McDevitt 1969).

The diagnosis is usually made by the demonstration of elevated levels of *adrenaline* catecholamines and/or their metabolites

although ventricular levels may be produced by other tumours histologically derived from neural-crest tissue, i.e. neuroblastoma and ganglioneuroma (Hinterberger and Borch Jones, 1966). The diagnosis may be confirmed radiologically by retrograde aortography, retroperitoneal gas insufflation aortography or aortocaval venography. The relative merits of these techniques have been discussed recently by Brown (1971).

The outcome was generally fatal until 1917 when the first successful surgical removal was carried out (Mayer, 1917). The surgical treatment of pheochromocytoma is still a hazardous procedure although in a series of 66 patients treated surgically Roth, Fleck, Kiehn, Waagbø and Ögg (1965) recorded 36 survivors without a relapse.

Clinical History

A 39-year-old Chief Petty Officer was discovered to have an elevated pressure of 200/100 at a routine medical examination prior to release from the Service. He showed any symptoms apart from excessive sweating, especially after the consumption of hot liquids. He admitted to nocturnal sweating the previous two years. There was no definite family history of hypertension.

Scrutiny of his medical documents revealed that five years previously he had been noted to be hypertensive (BP 160/100) while undergoing dental treatment and had been investigated in a Royal Naval Hospital. No abnormality was detected and mild essential hypertension was diagnosed. There was no record that his chemical tests for pheochromocytoma had been carried out. His blood pressure was noted to be 200/110 two years after this.

Clinical examination revealed a rather pale, thin and nervous man with a regular bounding pulse and pronounced arterial pulsation in the neck. There was no evidence of cutaneous flushing or cutaneous hot pigmentation. The thyroid was not palpable.

The fundal pulsations were full and not delayed.

The apex beat was displaced to just outside the mid-sternebral line in the left fifth intercostal space. The second heart sound was increased in intensity. Arterio-venous shunting was observed in both arms but no haemorrhages or ecchymoses were seen and there was no papilloedema.

ECG showed high voltage changes in the left ventricular leads with S-T depression and T wave inversion in V4-6 although no changes in the rest of the twelve-lead tracing was observed on chest X ray.

Plasma urea and electrolytes were normal as was the haematological picture. The urine was normal and there was no glycosuria. Constant diastolic pressure was 100 mm and IVU showed no abnormality. Colon rectal screening of a 34-hour urine specimen for 3,4-methoxy mandelic acid (Kilow, Dwyer, Mondkewicz, Khamis and Knut, 1963) showed no excessive mandelic level or short T max/24 hours.

Investigations were interrupted when the patient suffered an acute attack of itching in the left arm extending to the neck and jaw which was apparently precipitated by contact. Electrodermography showed persistence of the previously noted high voltage left ventricular pattern with S-T depression and T wave inversion in V4-6 and no additional showed T wave inversion in leads I, II and III and a WP. In view of the possibility of impending myocardial infarction, the patient was admitted to the Fish of Limes Hospital, Alexandria, Dumfrieshire. He made an unremarkable recovery from this episode.

Glucose-Pyruvate measurements were normal at 15 and 14 units/100 ml respectively and the lactic dehydrogenase was 250 units/ml.

No repeat examinations were done. The T wave changes in Standard lead III and at a WP were persistent. There had been no previous history to suggest coronary

being denied.

Having made an unremarkable recovery from this episode he was transferred to the MRC Blood Pressure Unit, Western Infirmary, Glasgow. Analysis of the urine for catecholamine metabolites showed 24 hour excretion levels of 47 ng and 1.9 ng of Normetanadoline (normal level below 1 ng/24 hours) 223 ng and 9.8 ng/24 hours of 3,4-metA metabolites and (normal level below 5 ng/24 hours) and total catecholamines of 220 micrograms (normal below 100 micrograms/24 hours). Plasma epinephrine level was 17 picograms/ml (normal 0-33 picograms/ml).

A phencyclidine infusion was then started and 70 mg of phencyclidine producing initially a gradual fall in systolic pressure followed by an acute drop to 70/40 at which point infusion was stopped.

The probe was left in situ and the patient, complaining of dizziness and discomfort. Noninvasive dilation was required to check the arterial pressure in the 70. The level prior to the test was not reached till four hours later.

An ultrasonic scan of the upper abdomen showed a rounded mass 3 cm by 4 cm above and medial to the right kidney (Figs 1 and 2).

The presence of a right-sided internal phaeochromocytoma was confirmed by non selective renal arteriogram (Fig. 3). Infusion of contrast was carried out with the patient supine proximal to the renal hilum in order to demonstrate any extra-renal phaeochromocytoma in the para-aortic area or pelvis. None was seen.

Having established the diagnosis and following pre-operative treatment with



Fig. 1. Ultrasound images of the upper abdomen. The top image is a longitudinal section (L.S. 15-25) showing a rounded mass in the upper abdomen. The bottom left image is a posterior view (Posterior 15-25) and the bottom right image is an anterior view (Anterior 15-25) of the same area. The mass is located above and medial to the right kidney.

20 mg. Phenylephrine and 20 mg. Fragmentol right locally, regional anaesthesia was administered by Professor A. W. Kay. The right internal was approached using a Thomas subcostal incision through the bed of the ninth rib. The fibres of the right lower diaphragm were divided exposing the phrenicomesenteric in the right sub-hepatic space alongside the posterior aspect of the inferior vena cava.

Location of these veins from the tumour entering the inferior vena cava and two entering the right renal vein was carried out. A plane of cleavage having been established between the inferior vena cava and the tumour the latter was avulsed causing slight haemorrhage from the tumour bed. Closure was carried out with the insertion of 1 silk suture in the tenth intercostal space. There were no marked



FIG. 1. Dissection of the tumour mass during the day, the inferior vena cava, the right renal vein, the right suprarenal gland and the right kidney were supplied by a large blood vessel. The right renal vein was ligated and the right kidney was removed. The tumour mass was then removed. The surrounding vessels were ligated and the tumour was removed. (By the J. G. Davidson)

fluctuations in blood pressure or cardiac rhythm during the procedure.

The post-operative course was complicated by a complete-positive, diaphragmatic adhesion of the lower wound. This cleared following treatment with Fungis Acid.

The diagnosis of phaeochromocytoma was confirmed histologically. There was no evidence of malignancy.

During the post-operative course the urinary levels of catecholamines and their main metabolites were as follows: Nor-metanephrine 0.4 $\mu\text{g}/24$ hours, 3-4 vanillyl mandelic acid 0.1 $\mu\text{g}/24$ hours, total metanephrines 50 $\mu\text{g}/24$ hours *vs.* all were within normal limits.

The arterial pressure had fallen to levels ranging between 100/70 and 120/80 on discharge.

Two months post-operatively the patient was readmitted for re-examination. The arterial pressure was 130/80 and the 24 hour urinary normetanephrine level was 0.3 $\mu\text{g}/24$ hours (normal level below 1 $\mu\text{g}/24$ hours). The ECG (high voltage changes persisted but the S-T depression and T wave inversion reverted to the normal pattern.

At the time of writing the patient is working in a Naval accounting office and as far as is known is in good health.

Discussion

The use of ultrasound in demonstrating the tumour illustrated the expanding scope of this method as a diagnostic tool. By recording the echoes produced by an ultrasonic beam from several positions a 'cut' through a single plane of the body is obtained giving a tomographic effect as demonstrated in Figures 1 and 2.

Holm (1971) demonstrated 3 adrenal tumours including 1 phaeochromocytoma, by ultrasonic techniques and concluded that ultrasonic scanning techniques have considerable value as diagnostic as a replacement to conventional radiology.

The value of ultrasound in diagnosing and in the demonstration of space-occupying lesions of the urinary tract has been discussed by Bennett and Winkley (1971).

The location of the phaeochromocytoma before surgery is by the radiological techniques mentioned. The dangers of such procedures are well known. In ultrasonical pneumography Kammor, Linder and Wietland (1955) reported 50 fatal and 64 severe reactions in 11,000 cases, the main risk being gas embolism. Aortography is associated with the risk of retro-peritoneal or adrenal haemorrhage, a death being reported as a result of 95 cases by Ross, Young and Pasko (1960). It is noteworthy however that these complications were associated with the older technique of direct aortic puncture.

Although the ultimate place of ultrasound in the investigation of extra-adrenal pathology has not yet been completely defined the advantages of its moving the dangers in the patient of aortic cannula and discomfort have been emphasized by Schrek and Hübner (1970).

The case in point indicates the value of screening for catecholamines in a routine in the investigation of hypertension.

In spite of electro-cardiograph and clinical changes the patient was apparently symptom-free. Subsequently his complaint of dizziness resulting was highly suggestive although at the time of his initial examination this could reasonably have been attributed to an anxiety state so he readily admitted to concern over his employment prospects on leaving the Service. The mechanism of the response relating to disturbance of phaeochromocytoma remains uncertain.

The absence of acute cardiovascular emergencies during the duration of the tumour and in the immediate post-operative phase is probably a tribute to the improvements in the management of these patients since the advent of adrenergic

blocking agents which allow control over the blood pressure and cardiac rate and rhythm.

Hypertension and tachycardia may be controlled by oral phenylephrenes and propranolol respectively whilst anaesthetic surgery. Phenylephrenes (1 mg/kg) should be given by infusion at 250 ml of 4 per cent dextrose saline for three days before operation. Syntress propranolol should be given orally for two days pre-operatively to maintain the pulse rate by one division. In addition 50 mg phenylephrene must also be given one hour before operation if the blood pressure is above 160/100. Propranolol is given according to pulse rate and whether phenylephrenes is required (Rios, Penhale, Kaulman, Robertson and Shriver, 1967).

An alternative method of medical treatment is cases where adrenergic blockers, i.e. selective or mixed blockade in the inhibition of production of catecholamines by alpha-methyl β -tyrosine which causes its release by blocking the hydroxylation of tyrosine to 3,4-dihydroxyphenylethylamine step in the biosynthesis of catecholamine drugs. Walker, Kaulman and Snoddy, (1964).

As regards anaesthesia for surgical treatment. Thiopentone should be given slowly during induction to avoid hypoxia even which may stimulate catecholamine release. Narco-oxygen and oxygen supply limited by desflur ether produces mild laryngeal spasm which lessens the risk of asphyxiation and consequent reflex in the massive release of these catecholamines being inevitable because of its vagomimetic action and vagus lacerate of its ganglion blocking and baroreceptor releasing effect (Schmidt & Myers, 1964).

The occurrence in the patient of an episode of myocardial infarction is of no great concern and Cannon (1958) demonstrated that high circulating levels of noradrenaline produced changes of focal myo-

cardium and haemorrhage lesions of the pericardium and endocardium in dogs comparable with lesions demonstrated at autopsy in patients killed by myocardial infarction or having a pheochromocytoma. Kline (1961) described treatment of myocarditis in four out of seven cases of pheochromocytoma occurred at autopsy. These four patients died independently from what was considered to be acute myocardial failure secondary to myocarditis. Whether this patients attack of myocardial infarction was complicated with a myocarditis such as described by Kline can only be a matter for speculation. It may have resulted from pericardial coronary artery disease or from a pattern of hypertension and tachycardia associated with catecholamine release. In this case there had been no evidence to suggest that either of these had occurred before in this case. Unfortunately the patient did not report his symptoms till about an hour after the surgery started making correlation with either of these conditions difficult.

It may be significant that the ST depression and T wave inversion on ECG recorded in normal after the removal of the tumour although the high voltage changes persisted. As the changes on ECG associated with pheochromocytoma and ST depression and T wave inversion (Wood, 1964) the reverses could have been an effect of removal of the source of the catecholamine which had raised the myocardium and was simply due to post-operative nature of the blood pressure to normal levels.

In conclusion because of the association of this condition in surgical treatment the necessity for treatment by the physician of its possibility and variable presenting features cannot be over emphasized.

Acknowledgements

The author would like to express his appreciation to Dr J. J. Brown, MRC

SERVICE PSYCHOTHERAPY SPECIAL ASPECTS OF THE THERAPEUTIC RELATIONSHIP

By A. W. Scott-Brown

ABSTRACT

Psychotherapy is the treatment of psychological illness by purely psychological methods.

This form of treatment is complex involving a number of techniques. It is affected by a number of variable and ill-defined factors whose effects are difficult to quantify (Briere 1971).

In the opinion of the author a major factor in treatment is the doctor-patient relationship, which is here described as the therapeutic relationship. The therapeutic relationship is at all times modified by the society within which it operates. The Service almost certainly imposes its own specific modifications on the relationship. These modifications affect the psychotherapeutic relationship of all Service doctors and not just the specialist psychotherapists.

Summary

- The Service imposes constraints on the therapeutic contract, especially those the area of treatment and the criteria of cure.
- Confidentiality is limited, reducing the trust of patients.
- Duration of the Service constrains the therapist and he must be aware of the Service rather than the criteria aimed for the patient.
- The Service imposes pressures on the patient to conform to a behaviour pattern. This reinforcement pressure can worsen the problem of over-dependence on the therapist.
- Pressures from the Service and the

patient can lead to a concentration on the problems of external social adjustment to the detriment of the patient's internal emotional adjustment.

- One specific advantage of therapy in the positive support of Service men and group identity which has been called 'institutional Transference'.

Rosenblatt (1960) asserted that psychotherapy as a solitary activity could be as effective as that done in other situations. He qualified this however with an appreciation of the particular limitations imposed by the Service.

Other authors disagree. Ungewitter (1961) stated that effective intensive psychotherapy amongst troops 'may not be as feasible and perhaps not possible'.

The author feels that psychotherapy can be effective in a Service situation. Its scope may have to be limited and it is intended to discuss this in another paper.

The author feels that it is important that the therapist remains constantly aware of his relationship with the patient and of the ways in which the therapeutic contract is modified by the Service life situation.

It is possible to identify some of the specific problems of Service psychotherapy which are not present in the civilian situation.

The criteria of 'cure' are imposed from outside the therapeutic relationship and what may be regarded as a satisfactory readjustment by the therapist may not be so regarded by those society. Other

not, 1970). A further source is the implied obligation on the patient to be treated and sometimes the pressure on the therapist to treat against his better judgment under the shadow of former discipline.

Psychotherapy may be a relatively prolonged process and could therefore be regarded as subverted to the pressures of time imposed by the managers of the Service. White (1960a) and Mendel (1966) suggest that the leader (the therapist) who better the rank others would regard best therapy as 'the child of better practical necessity'. The freedom of the therapist and patient to decide the end point is, as desirable a freedom as that of defining the 'cure'. The lack of these freedoms are important problems in that the therapist can be seen as an agent of society not the patient.

Stigma is a major problem. Often the individual for whom therapy would be most helpful and rewarding is deterred by the effect that seeking help could have on his career (Kinsworthy, 1965). The mixed feelings about therapy may require prolonged painstaking working through. If they are not resolved, premature termination of treatment can result.

The single for the malpractice in all but name is, it is regarded as a Service who state where secondary gains are most rewarding. Such individuals attribute hostile feelings to the therapist which may contaminate the relationship, even when self-improvement does not result (Baker, 1970).

In sociological terms the therapist can be seen as a form of 'Total Institution' (Goffman, 1961) and it is claimed that this institutional factor adversely affects the therapeutic relationship. Goffman in particular expressed concern over the constraints placed on the 'service' in his relationship with the 'served'. Acceptance or rejection of these constraints may harm or 'benefit' patients. If the therapist is not seriously aware of the situation and able

to act appropriately, he may well harm the patients. For instance, it is equally important not to unconsciously exaggerate these constraints.

The author recently had an experience which reinforced his concern about the effect upon the therapist's standing of referral by the Executive to the Psychiatrist. A patient was seen in 1968 in Singapore. He had gone abroad and was awaiting something to determine when he was referred to the psychiatrist. Behind this referral there had been a dramatic conflict. The individual had many problems in his life situation caused by his early life and psychotherapy was obviously indicated. There was no doubt at the time that this man was responsible for his situation and the therapist had to stand back and allow whatever stress to take place with the offer of therapy afterwards. However, because of the way the psychiatrist was used, he was identified by the patient as part of the system and therefore took an aggressive role. The patient was seen some two months ago and was able to recount his feelings about the situation. He stated that he blamed the therapist for the fact that he was in jail. Being seen then at his request in a way the patient was able to look at the situation objectively, namely how he and the therapist were both placed in a theoretically faulty position, namely by the way the referral had taken place. The patient in a very different referred situation was able to obtain some help on the situation.

While the Service authorities seemed to minimize the problems of external control, it is impossible to ignore what has been described as 'the diverse attitudes of individuals within the institution, who are in possession of authority with respect to the prospective patient' (Dealey, 1967). Such problems can apply equally to the therapist.

The therapist needs insight into his own

relationship with the Service (Barr 1970). Such a role is to help his patient. Such would be clear and above what is required of the civilian therapist. Barr (1961) doubts it is possible that the therapist should be able to accept the aims of the Service. Without this and a knowledge in depth of Service life, he felt that the therapist might have considerable feelings of guilt about treating a patient to serve. This is confirmed by Mint (1970) who vividly describes his difficulty in relation to Wests' case. The harm to the patient of overt identifying with him because of perceived aloofness is well discussed by Frost (1970) who points out the danger from dangers of identifying the maladjusted or deviant as 'self'. A disturbing McManus case is presented by Claxton (1966) who stated that 'even military psychiatrists do not perceive much conflict to require resolution'.

Of these various approaches that of Barr appears most balanced and realistic. His view allows the adoption of the correct, compatible attitude (Williams 1963) rather than one which is antagonistic or rejecting. This results a degree of identification with the patient, viewing the problems from his viewpoint whilst at the same time maintaining an objective distance which aims to increase the realism of Service situations.

The issue of confidentiality frequently arises because of the intimate nature of the problems. There is no doubt that this can affect therapist and patient but not to the degree claimed by some (Barr 1971). Of great assistance is the view of Claxton (1966) that the issue should be openly discussed with all its implications. In the author's own experience such a resolution leads to a more secure and trusting relationship which can work towards realistic goals.

Over dependency is a major problem in therapy of the serviceman, and he is apt

to have unguessed expectations of the therapist. This is partly based on reality as the Service psychiatrist has very real powers to act as a Naval Engineer and man power the patient's life on shore. The way however to a shared Working (Duby 1970) and cure is through honest psychotherapist aim to keep their patient independent and they may well receive sympathy for this from a patient whose expectations are different. It is all too easy for the therapist to meet being manipulated and to hinder therapy by responding.

The dilemma in therapy remains the choice of the individual's self adjustment or his environmental adjustment to the aims of therapy. This raises the problem of whose agent is the therapist and all the questions which this raises.

Some authors (Barnard 1968, Barr 1970) doubt whether the aim of individual self adjustment is possible in the Service and the bulk of literature on US Service psychotherapy deals with social adaptation. Although individual oriented psychotherapy is more prolonged and ambivalent it has certainly been shown to be highly effective in selected cases. Such cases are probably those Duby particularly describes as 'exam novices who stand partly to not help with their own conflicts of standards beneath layers of other people's problems. The bulk of our cases however could better be described as people who are overly evident in those at the centre surrounded them. Society like the patient, requires us to change the unacceptable characteristics of the patient.

The massive failure of society, the patient and the therapist sometimes each other in the pressure of the situation requires a lot of patient working through to be achieved. The very aim of Service psychotherapy has many implications in particular its work towards. If the therapist is to continue to function, he has to be aware of his own involvement in the situation or the

positive will be helpful in seeing him as he is.

It is always tempting to stress only the negative and professional aspects of a situation. There is however a positive side to Service life as reflected in current problems. All are aware of the support and tolerance which come which has been called institutional transference by Fromm-Reich. This not only helps the patient but supports the relationship with the therapist.

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A YEAR WITH THE ROYAL MARINES

By Carl G. M. Hollum

Finally, the glacial ice broke his way into the mountains like the Royal Marines previously with its problems of adjustment. Not least to them was the short day, the discipline and the unforgiving Commando Course itself. It is also necessary to develop a considerable loyalty to the Corps in order to get the most out of a training year spent with them. Mentally, you are dealing with fit healthy human beings who push themselves close to their physiological limits and have to be maintained in good health at their limits. One also deals with much tension and antagonism. Having now got to grips with those aspects, there is as much excitement and interest with the Royal Marines as the Royal Navy can offer.

Six months after completing the Commando Course at Lympstone in January 1952, I was asked to fly to Norway to provide medical cover for Royal Marines who were taking part in Exercise "Cluck, work 72." On February 23 I arrived in Bardufoss, a Norwegian Air Force Base 300 miles north of the Arctic Circle. It was evening when I arrived and my first glimpse of the Arctic was the pure white country and the arctic sun setting behind the black and white mountains. I was amazed and slightly disappointed to see that there were houses and most to the arctic, and people standing about talking quite normally as I had fully expected to be frozen right to noon as I left the plane.

The marines were living in a Norwegian Army Reinforce Camp at Ørlogsbakken between Haaland and Narvik. They had recently returned from a short course at Trondheim to see who had never died

before they all appeared again. However, these were four weeks before the Exercise, and after the last freeze each morning I was able to attach myself to one or the other of the training teams, where along with the marines I was taught not only to die but also the art of Arctic survival and winter warfare. The instruction was extremely good and as in the Commando Course itself they managed to persuade the troops that he actually wanted to accomplish the extraordinary and often unbelievable feat they were tackling.

The back Bay consisted of a well stocked treatment room and one six bedded ward which were heated by back log fires. The back freeze consisted mainly of skin-tearing trauma or the unpleasantness of living in the Arctic. The atmosphere was very dry and wet clothes were very uncomfortable and upper respiratory tract infection often developed into a pneumonia. Although the temperature in last rarely fell below

10°C occasional cases of frostbite and snow blindness occurred. There was no qualified General Hospital 12 miles away in Narvik when I could admit patients and get X-rays taken etc. The doctors there were a mass of informants about cold climate medicine and hypothermia which they were treating by the discovery, use of heated oxygen. Another common condition was Paronychia. One marine developed a unilateral convulsion near Trondheim and he was flown to a neurosurgery unit in Trondheim by a Norwegian Army helicopter.

The Exercise itself was not only very interesting, but involved living out in snow holes and makeshift huts in the most

domestic systems of frozen lakes and water faults and surface back forests. I was supplied with a self-driven snow track car balance which enabled me to not even more of the countryside. At the end of the exercise there were really severe run, frozen including long periods of when out when suddenly was almost gone and our instructions in Arctic survival were put to the test. I thought the clothing and equipment we had were excellent and that the Arctic rescue packs supplying some 2,000 Calories for 24 hours were not only more than adequate but also very pleasant to eat. I returned from Norway at the end of March and joined 41 Cita Group who had just withdrawn from Malla and were preparing to leave for the West Indies and Florida for hot climate training and an exercise with the US Marine Corps.

We left Portsmouth on HMS *Salisbury* on May 4 for a small island called Voegat, some miles southeast of Puerto Rico. On the way across the Atlantic, we thoroughly practiced disembarking in Western heliport first flying across the ship and then it, embarking again. As a result the method used for disembarking the Commando Group to an objective and returning it later, this was done over and over again. The procedure, when possible, formed very rapid literally only we were dropped by helicopter among the birds in flight. We set up our headquarters And Post on a deserted beach. The location was a holiday brochure "island paradise" with people on one side and what was and was on the other. The Regatta, all And Post, was actually set up under a coconut tree. We ate the coconuts. At times laughing birds hovered even in the tent staff and the surrounding was reports.

The medical team stayed on the beach for eight days learning about the island while the Marines trained hard for their exercises. The only medicines were severe medicine and first aid education and a very small number of large, small, large, large

hills there were no wind, no rain, no sun, no heat and imposed people, no, when not included rapidly and about them all. They also scavenged anything edible they could find in the camp. There was a small local population who was, mostly farmers and garden of Puerto Rican origin who were looked after by four local doctors in a most modern and efficient health clinic, almost none being from the Puerto Rico. There was a schoolmaster born in the land where someone and people on the island but it was not nearly so easy to attack this. The parents appeared to be schoolmaster, however, however drinking and eating through the water was forbidden just in this, no children had been raised etc.

We left Voegat on June 3 and sailed to Pappat in Florida, where we stayed until June 10, sailing various of the United States Navy and then returned to Voegat for the last exercise, with the USMC. This involved much more moving about than the landing period, and although the island was low, for every way it enabled us to see more of the island and its contents. Large land crabs that ran all about in the lower turning up great mud piles and small colored pieces, not looking up. There were also large, large birds that in four weeks were that used to be used for progress, flying, flying and also was, very common and extremely abundant and persons which are among the most graceful of all birds in flight could be seen, flying in many of the days. I made several trips by Scout helicopter to Puerto Rico with patients for X-ray and this provided an excellent opportunity to see Voegat from the air. The current trend there, and a half day, and included a beach landing by a USMC Battalion Landing Team which was most spectacular.

On July 4, after an uneventful passage, we arrived in Malla. HMS *Salisbury* being

the first ship to visit Malta since the war, departed. The Commando quickly returned with its families to Malta and life rapidly returned to its pre-withdrawal state. Here we remained until October 22 when we sailed for Cyprus. The ship is HMS *Argus* and HMS *Forster*.

On arriving at Sudaia in Cyprus we were taken to Landing Craft and began training in the Beach Halls which are low rising hills covered and desert like and extremely hot even in October. The air was still rather wet in Malta and was then valuable for training as well as amusing.

We remained in Cyprus for a fortnight practising assault, clearance, camouflage, and amphibious training and then returned to our home at Afrin. St Andrews Barracks.

The Unit went ashore with a fairly good daily routine but no relaxing work and during winter time, a clearing and progressive Sub Aqua Club and a not unenjoyable night life.

The Command Group consisted of about 1000 men and I held a sick parade each morning. When in Malta I also took a turn in the Hospital Clinic about five and even six and eight out of ten, which enabled me to vary my practice and see women and children as well as men.

After a fortnight back in Malta we sailed for Crete. On the way we were joined by HMS *Andard* and HMS *Ark Royal*, which when manoeuvring at close quarters with the assault ships made an impressive looking Task Force. We went ashore in Crete in Landing Craft, starting our



Commando Task Force in front of Sudaia. From the Daily Telegraph, 1945. Photo: ADM Archive Trust.

... nearly the 2nd Portuguese Division of the French Foreign Legion. The terrain in Corsica was possibly more spectacular and different again from any we had seen so far: steep mountains thickly covered with vegetation and very hard going. The rainfall in many badly twisted gulleys and ravines was enormous. However it was very beautiful and even though by now November, it was bitterly cold at night, it was still quite warm by day. The mission finished with a day spent in garrisons of the French Foreign Legion in their Garrison at Corte. I was entertained by three diophs who looked as wild and ferocious as the other Legionnaires and were responsible for, amongst other things, the Corsican *Armed* which he ran with disproportionate resource efficiency as if it had been a loan clothing store. However, as he pointed out the Legionnaires could not marry until they had completed nine years' service, and they had never had a welfare problem in the French

Foreign Legion since it had been founded in 1831: a model for an institution in that?

For a 'back off the back' when we left Corsica, we dropped into Toulon for three days. What a joy! After Norway the Caribbean, Florida, Cyprus, Comoros, the South of France and then home to Malta. Could it have been better? I doubt it especially as it was all at public expense. It's true that at times one has to put up with some physical discomforts but one gets a wide variety of medicine to prevent just many things one would never see as a GP and one is rarely away from one's family for more than a few weeks at a time. I look forward to another year as good as the last. It is certainly the life for me and I recommend it to anyone who hasn't reached the stage of wanting to put on his carpet slippers and nod off in his arm chair simply because he can't think of anything better to do. Come on in. The water's lovely.

SOME PRECURSORS OF THE ROYAL NAVY MEDICAL CLUB

By the late William N. Doug Watson

A Society of Surgeons of the Royal Navy was founded in London in 1716, its meetings being held in the Society's rooms somewhere in Covent Garden and occasionally in one of London's rising houses. The names of the founder members are unknown for as the only surviving copy of the constitution, deposited below the steps awarded to various apartments in 1616, it has been claimed for this body that it was the first association of professional men formed in Britain for the purpose of mutual discussion and enquiry (Widd, 1921). Although the Society was not at first the very first — the Royal Medical Society of Edinburgh was formed in 1734 — it marks the aspect of medicine for the early date of its foundation and for its existence, especially considered design of scientific research. The fact that the Society achieved little and came to an obscure end in 1762 should not blind us to the enterprise of its founders.

The Scottish Record Office contains a number of writings relative to naval medical men. Among them is a manuscript (Scott. Rec. Off.) originating from a naval surgeon James Dudgeon, a native of Haddington, Fife, London, which bears directly on the beginnings of the Society. It is a copy of a draft constitution written on this thing that which was finally approved. During the war of the Austrian Succession, Dudgeon, awarded out of the Royal Navy in 1746 with a long absence, applied for reappointment in 1767 and obtained the support of an influential local landowner Sir Hew Dalrymple of North Berwick. It seems that as proof of his continuing need for the sea service he sent this manuscript

to Sir Hew along with a copy of his application and it is tempting to think that James Dudgeon may possibly have been one of the Society's founder members. The manuscript reads:

ARTICLES TO BE OBSERVED BY THE SOCIETY OF SURGEONS BELONGING TO HIS MAJESTY'S ROYAL NAVY

1. That every Member of the Society shall Communicate in the Society for the next Year, all Discoveries, Cases, and may happen on this point, or should any of the Members have a Receipt of Society to be entered in a Book kept for that purpose.
2. Every Member that shall by any Means be prevented of any New Discoveries or Inquiries shall Communicate to the Society an Abstract of the particular Effects of such Medicines or Surgery with the original Data, the plan of the Operation, the manner by which it was performed in hand, and with a copy of the prescription or the like, &c.
3. No more to frequent important cases or performing Operations in Surgery after an experiment and therefore the Members shall be encouraged by the Society to put on the most useful of Operations, as, e.g., a course of Operations and Dissections, from every year for the benefit of the Society the body in the field at the General meeting in January and the Executive in the past end of the published Book.
4. Every Member of the Society shall pay one Guinea upon admission and also contribute to the purchase of the Library of the Society from the funds of the Society, the necessary Expenses of printing and other expeditious relating to the Society.
5. No Member to be admitted into the Society but such as have been or are physicians or surgeons in his Majesty's Navy and that no Member for practice in hand with him to any of such members and persons that is not a Member may be admitted by the Approbation of the majority of the Members present when the society shall be proposed.
6. That the Society shall meet every Week except on a Friday on the Evening and every Member present shall pay one

debates, and on no subject was it the members' duty and so the speaking and debating, it has to seem the debating and second that are the sufficient for that purpose. I shall be made up out of the medical stock, and of one Member is required to say any paper at least in one of his Talks in his own language and discuss them on Monday; but the demands do not let any paper during the hours of Monday.

- For the better regulating and conducting the affairs of the Club, January is a fitting month to receive their talks; the members weekly meeting there should be, one Member held every year for the meeting of the Association and other some general purposes of the Society. It is hereby ordered that the next Annual Meeting shall be on the first Wednesday day in January, where the same shall be carried by the members towards which request every Member is to be present and shall pay by next half a crown at the meeting before the hour the members to be paid out of the public stock.
- Every Member shall be annually elected by the Majority of the Members present at the yearly meeting, of January who shall be empowered to receive the subscription and all other Moneys due to the Society and shall be deemed promoters for the benefit of the said Society and the said Moneys are to be paid yearly meeting to the public stock. Besides all all Moneys paid and received and all other Moneys due to the Society shall be paid the New Members for the use of the Society who are to pay a share for the vote.
- It is agreed that no Member of any kind relating to the Society shall be elected upon any one Question and when one of the Members shall be present and then other Questions stand.
- Every truly Member who shall have the year full in show from January any one other freely printed shall in and after, be entitled to change on persons dependant and Children for every such year to be subject to the laws, subjects to be, respectively decided.

It is clear that from the start, the prime purpose of the Society was the furtherance of medical science with not much care for the furthering of knowledge. It is true that the statutory annual gathering was to be called a feast but it was primarily a business meeting. At the weekly meetings drinks could be ordered, but only by the stewards, and members wishing to have supper together had to eat it almost unconsciously at a table apart. From these

concessions to good fellowship were later omitted and the duty to procure supper emphasized as the final drift of the constitution (Barthol., 1924) which was approved at a meeting of the Society in January 1747. The story ends with a possible

"Whereas it is most reasonable to believe that the establishment here, having had a right understanding among the subscribers of the Royal Society of some persons who be of great service to the public, from its general use, and to all other Members, should not permit themselves to be so concerned in their own duty, but should, through a policy to have themselves into a SOCIETY, and to open to the following ARTICLES, which they signed, they at London at the year of our Lord 1746."

The articles that follow show a number of amendments to the original draft. Honorary membership is made open to any person connected in the medical profession and of established character; all references to fees, support, liquor and payment of voluntary is dropped; members are restricted to contributions to the Society all of markable cases in physics or surgery which they meet, when there are records of these contributions to form an order volume. They will be moved by an elected committee and published at the Society's expense. All items are frequent improvements in *Physick Surgery and Anatomy*, says the constitution; the Moneys are empowered to give Directions that annual Lectures be read on any branch of these professions. Finally the charge on premises is corrected from one guinea for each seat to one pound per seat of the same reserved.

The first contracted course arranged by the Society was a series of lectures and demonstrations presented by Samuel Sharp (1702-75-1778) a surgeon at Guy's Hospital. Among his audience was William Hunter (1718-1783) famous as an observer and still more famous as founder of the Westminster School of Anatomy, where for many years dominated the teach-

ing of that subject in London. Hunter wrote down notes of Sharp's nine lectures and these are preserved in Glasgow University (Miss Linn Lill). He headed them *Notes on a Course of Chymurgical Optics* (note performed before the Society of Physicians (last Surgeons) by Sam Sharp of Guy's Hospital, March 1744). Frequent attacks of asthma made Sharp withdraw and his place was taken by Hunter whose lectures were so popular that he was asked to extend his field to surgery and that he seems to have done for a time. Despite this promising start the Society failed to prosper. One reason must have been that the number of surgeons dropped in 1748 when pain was declared and several members withdrew; many too must have been deterred from joining by the cost of membership. At a time when a surgeon's pay was 2s 6d a day (Lloyd & Clouston 1964) an annual subscription of a guinea more than a week's pay was required after payment of a life sum as entrance fee.

It was no surprise of the *Wagon Shop Solution* that Hunter (and in 1747 even during his speech making experiment in the case of surgery (Lind, 1755). The new charter defined in a *New Plan* of the Society ranked that one surgeon was, in a unique position to add to medical and surgical knowledge. In both its draft and final forms the constitution made it a duty of members to submit papers for publication by the Society. This obligation was even more clearly defined in a *New Plan* of the Society of Royal Surgeons drawn up by some distinguished men and published in 1751 (Fowley 1926). In the first paragraph members are instructed to investigate the nature of new diseases and any material difference between them and those already on hand; the constant effects of surgery as well the effects of climate of war and that in various diseases; distinguish endings on their different seasons and delirious in symptoms and the general out-

come of the disease between war and danger; the treatment used by local practitioners at those seasons; anything of interest concerning natural history, weather, fossils, methods used locally to produce drugs from local plants; suitable collection of which should be obtained — an ambitious programme, indeed! A second paragraph devoted every member writing to the British, the Mediterranean, the East Indies or America to list the countries have reasonable notice of the surgery so that they might prepare memoranda and instructions for him in order to carry out those projects.

The thought of having to write papers for publication must have appalled more than one naval surgeon that as it well might do under North's policy, however, was sufficient for the obligation seems to have been universally ignored. The fact is that the Society has only one publication to its credit and that can be written by an honorary, not a serving member. The work (*Miss Lill*) was published in 1751 under the rather sinister title *Some reflections on the nature and consequences that may attend or prevent the participation of dead bodies* was dedicated to the members of the Society and was written at the desire of the medical committee by James Blairgrove M.D. Hon. Member of the Society.

A few advertisements of the surgeons' designs have been found in the London newspapers (Fowley 1926). In December 1749 and December 1750 annual general meetings were announced in the *Common Crafts* column. Another meeting was advertised in September 1751. In September 1755 Dr Andrew Baker announced that he would begin a course of lectures on *Materia Medica* and the Theory and Practice of Physic in the Society's apartments. List of all names in attendance in the Whitehall Assembly Hall of December 1756 calling on members to meet their brethren and dis-

at the White Horse in Whitehall on January 8, 1783. This seems to have been the Society's closing business for no later mention is to be found.

Disappearance of the Society was followed by a gap of 150 years during which no attempt was made to form anything like it on a Harpersfield scale, but the interest in form associations is strong and from time to time when circumstances were favorable groups of sea surgeons came together in local groups for the fostering of good fellowship and professional interest. War and with it a temporary increase of numbers was one of these circumstances. It seems that throughout the years groups have been formed and dissolved leaving no trace in public records or published chronicles and that a number of these per-

sonal letters and despatches which survive can bring them to light. The present writer has come across numerous of these war time accounts in the unpublished despatches of two naval surgeons. On November 2, 1775 during the War of American Independence James Kerr, newly appointed to the *24-gun ship Chichester*, recorded in his diary that:

When aboard the *Chichester* for the first time we had board a letter from, among others, to a meeting of the naval surgeons of the Fleet. Captain Bland, W. M. David Watson, M. D., Surgeon General, attended the meeting at 11 o'clock. We were then left after dinner — a very bad day for the accompanying officers whose judgment and presence was required. Fleet staff is composed of surgeons, etc.

The two other references come from the journals preserved in private hands of Thomas Robertson, surgeon to the Royal



THE CATERPILLAR BUS AND ACCIDENT IN 1877

In a corner of Whitehall, the scene of the first accident of the Caterpillar Bus in 1877

Navy from 1785 to 1818, who in 1797 was serving on the frigate *Dorchester* on home waters. In March when at Portsmouth he made the entry:

The surgeons of the Navy have a monthly meeting at the nearest tavern. I was once there — poorly regulated, the meeting the, etc. This is not only a medical and social conference but often settles disputes in the army on and consequences of the body in the management of the war.

Eight years later Robertson was on the frigate *Sphinx*, one of the first blockading On French Atlantic coast. In March 1805 he read with satisfaction as a surgeon the new regulations governing the medical department of the Royal Navy. These brought about important improvements in pay, conditions of service and status. In May the fleet returned to Plymouth and Robertson wrote:

Coming into the Harbour yesterday, in the ship *Minx*, I had a party of the ship's company. It being the dinner day, had a number of company of 100 persons, the captain had only 100 persons, the dinner of a few sailors.

Before 1805 an surgeon had no distinguishing dress and such were the powers of his choice. The 1805 Regulations laid down that an official uniform was to be worn and the surgeons were asked to take up the matter which affected their professional status.

The Naval Surgeons' Society of 1796 has its successor today in the Royal Navy Medical Club incorporated in 1912. This differs from its predecessor in being fundamentally a convivial fellowship. The idea of a Naval Medical Dinner originated in the Royal Yacht *Victoria and Albert* not long before the 1844 1850 was Fleet Surgeon A. S. Buckart and a colleague. Fleet Surgeon J. F. Urrall Thomson, involved naval medical officers and received overwhelming support in favour of such a banquet. The result was the first Naval Medical Dinner held in London in the Criterion Restaurant in January 1859. In 1911 it was suggested

by Surgeon General Sir James Fyfe that a Royal Navy Medical Club be formed with the object of subscribing to and maintaining the Naval Medical Supplemental Fund, a philanthropic agency. The result was that in 1912 the Royal Navy Medical Club was born. It has purchased a dining club, not after all associated with naval medical education, but for a time in 1943 the Club moved into a water field by sponsoring the *Journal of the Royal Naval Medical Service*. In 1953 the place of dining was transferred from a London restaurant to the Royal Naval College, Greenwich thus making the gathering still more truly a Navy function.

Acknowledgments

The writer expresses warm thanks for help received from Mr C. P. Fookes, Edinburgh University Library; Dr Charles Newman, Harrow, Librarian, Royal College of Physicians; the staff of the Historical Records House, National Record Office, the City Archives, Portsmouth; the City Librarian, Plymouth; and Mr Robert S. Home, LRMA, Surgeon Captain R. M. Eames, DFF RN, has very kindly supplied information about the Royal Navy Medical Club. The draft constitution of 1946-47 is reproduced by courtesy of the Hon. Wendell Willoughby, Es.

Notes

- James Willoughby (formerly Willoughby MSS) a student of Edinburgh University 1758-59, settled in Canada in 1774, practised as a general practitioner in Charlottetown, he visited as a guest of a friend, a student of medicine in 1779 and became a practitioner of medicine. (See *Reminiscences of London 1779*) obtained his name in Willoughby, recognized as MSS. He gave his unpublished account as a learned and distinguished authority. His works are collected, published in 1794, contain a medical and local of reference. His account of an epidemic event have been identified by the students of the Academy which also required him to write *The New York 1779*, a memoir (photographed) and descriptive poem in literature.
- James, before 1800 obtained Licentiate of the College of Physicians 1754 and started

element in the Middlesex Hospital Band was again lost when he resigned the post of W.D. in 1791 from Abchurch Lane, the circumstances, one of the outstanding questions was the Irish Republicanism already mentioned.

3. *The Stone Table Stone in Portsmouth Customs, Portsmouth City Archives* and had no reference to the place, or the records, in the opinion of Mr. E. S. Stone, LL.M., who has close knowledge of the history and topography of the District; the pollen found there have dated within 1000 years from an angle with the Band.
4. *William C. Pittman, City Librarian* has failed to find any pollen found or taken within 10 years within records.

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It is deeply regretted that the author of this interesting paper died before he was able to see it in print. Dr. W. M. Hoag Watson has been a long and valued subscriber to this Journal and has contributed several interesting historical articles which we have been very happy to publish. We extend our deepest sympathy to his widow as her and her (Edna).

THE ROYAL NAVY MEDICAL CLUB DINNER 1973

The annual dinner of the Royal Navy Medical Club was held in the Princes Hall, Royal Naval College, Greenwich, on Friday, September 14, 1973.

The President, Surgeon Vice Admiral James Watt, OBE, MD, FRCS, delivered the following speech.

Admiral Lavin my Lord Distinguished Guest Members of the Royal Navy Medical Club.

It gives me special pleasure to welcome you to Greenwich where this year is celebrated as centenary of the Royal Naval College. Having dined in such style I am sure you would wish me to thank Rear Admiral Elia, Captain Hard and Commander Brown for continuing to afford us the privilege of returning to this beautiful hall and Lieutenant Commander Crouch and his staff for our enjoyable meal and their attentive service. The music of the orchestra of His Majesty's Royal Marines RNRB Chorus has greatly added to our enjoyment and I know you would wish me to convey our appreciation to the Band master.

The presence of the Admiral President is tonight's evidence of a partnership which has spanned for beyond the life span of this College in fact in the year 1889 when executive officers teamed up with a physician, surgeon, a statesman and his nursing staff to found the Royal Hospital at Green which built to Wynn's splendidly conceived plan. It appears however that despite our mature look precedence over medicine and surgery for in this great hall upon a hot day would be gathered together the Commander his officers and crew of unalloyed conviction to not only maintain and develop the King's health in a medical precept that meant while the surgeon performed his operations in a dark and the physician attended his laboratory in a back kitchen.

Where that partnership existed in fact it was also founded upon a trust rather than a professional subservience if we are to believe the protest of the surgeon's mate of HMS Porpoise for that same year (1886) in this case however the practical association of the doctor with his captain was abruptly terminated by an affair of the heart and the doctor's body died to the mercy of the elements in an open boat.

Nevertheless the professional contribution of doctors has left its mark upon naval history. The nineteenth century was dominated by surgeons and Clerks, Woodall Youngs and Maple established principles of naval surgery which served two laws as there only two engagements. It fell to the physicians of the nineteenth century Lord Trevelyan, Wilson and Gellibrand to rid the Fleet of the two diseases and prevent Nelson with the fit man he led so bravely to glory. The careers of the nineteenth century engineers were in large measure due to such capable scientists as Babcockton, Houlier and Marley who in collaboration with Darwin laid the scientific basis of modern biology with its far-reaching consequences.

It was therefore entirely appropriate that when our links with Greenwich were renewed only in the twentieth century, our relationship with the College should be re-established upon a professional basis and the Royal Naval Medical School led on from here from 1903 until the outbreak of the Second World War. However the technology which dominated the shape of the post-war Navy also determined the character of its medical service and the Medical School was absorbed into the complex of research and training facilities which is now the Institute of Naval Medicine. In a few weeks time I shall have the pleasure of opening its new Environmental

Medical Laboratories, which include a facility unique in Europe in enable us to simulate the environment of a submarine laboratory under controlled experimental conditions.

The next experience, the extent of 500 steps leading programme at the Institute and the Royal Naval Hospital at Haslar and Plymouth and it is gratifying to record that an earlier start is now expected to be made on new staff accommodation for Plymouth which will enable it more conveniently and effectively to meet an increased NHS commitment for the City. When I opened in new Plastic Surgery unit earlier in the year I was able to see the happy partnership which exists in this busy hospital between civil and military medical and nursing staff and I should like to express my appreciation to Mr David Matthews, our Consultant in Plastic Surgery who helped to make this imaginative scheme possible.

However, new facilities can by no means confined to the naval hospitals and in vocational specialties. In May I was invited to open a purpose built naval medical centre in Hong Kong and we now have a number of excellent general practices in most desirable locations throughout the world. The development of naval general practice requires, of course, opportunities in the United Kingdom both for vocational training and a continuing professional career. A training scheme is already operating in the area of the Clyde Submarine Base and a number of different regional medical schemes are currently being considered with the authorities concerned. I should like to acknowledge the work of Dr David Blair who has been responsible for much of the planning. At a time when we are encouraging our medical officers to join the membership of the Royal College of General Practitioners it is a pleasure to have with us tonight its President. On the authority of the College and also Lord St Leon who has done much to establish Haslar who contributed a most valuable

paper on training in general practice to the First Report of the Armed Forces Committee on Postgraduate Medical and Dental Education.

Opportunities available in the Dental Service for post graduate education have also greatly increased particularly for dental practitioners in the permanent service who are encouraged to take appropriate higher qualifications. One dental officer on an exchange appointment in the United States is studying at George Washington University.

There has been one development within the medical profession which, I believe, carries important implications for Service medicine and the Navy in particular. That is the recognition of the status of the medical administrator, the training and academic qualifications he will require and the change in role of the medical officer of health to that of community physician. It will mean a new deal for the general duties medical officer and we have already taken the first steps in that end by introducing this year, a medical administration course covering a wide field of civil and associated NHS interest and by appointing former naval medical officers of health to staff posts in which they will administer the local health care of naval communities. The new style medical officer will therefore be better trained better informed about Fleet matters and better able to choose from a variety of options the career which will enable him to progress by logical steps to the most senior appointments.

The opportunities now offered have been referred as improved recruitment and particularly in that most valuable source of medical manpower direct entrants who as direct entrants will attract specialists while the number of short service officers taking 10 year and permanent commissions largely removes any immediate anxiety for the future and this is true also of the Dental Service. These opportunities have been reflected in medical vacancies over 50

medical and dental officers attaining higher qualifications during the past year. Clinical research has never been more enthusiastically pursued and our Clinical Research Working Party now includes Professor Donald who is chairman of the Royal Naval Personnel Research Committee. Despite his wide experience to bear upon dental problems.

Royal Edinburgh Prize for 1972 was awarded to Surgeon Commander Blacklock for his original research on the parasite which has gained international recognition. Surgeon Commander Manton Thompson for his studies on the effects of prostheses on the dental situation and Surgeon Lieutenant Williams for his persistence on the hazards of smoking. This proved an outstanding success and has been adopted by several local authorities. It was presented the popular press with a good if apocryphal story.

Surgeon Commander Rowles was presented in the United States with the Firth Award of the Aerospace Medical Society for his research contributions in the field of aviation physiology, and at the 1972 British Medical Association Film Conference, Surgeon Commander Gidley obtained a Gold Award for his film on Hypocholesterin and Surgeon Captain McDonald a Silver Award for his film *Give Him Air*.

It is a pleasure to announce the publication of the Hurry-Flacher Prize to be awarded annually to a dental officer who makes an outstanding contribution to dental health in the Navy. It will commemorate the work of Fleet Surgeon Hurry who studied the dental health of sailors at Sheerness, Barwick and in 1825 submitted a memorial which formed the nucleus on the road for dental care in the Fleet. It also commemorates the late Edward Ernest Flacher who was head of the Dental Branch from its formation in 1908 until his retirement as Surgeon Rear Admiral in 1948 and who thus can be justly described as the Father of naval

dentistry. The Trust Fund has been started with the gift of £250 by two serving Dental Officers and a commitment of £20 a year. I must scarcely add that Surgeon Rear Admiral Flacher would welcome further donations.

Despite the fact that most of our young men are now pursuing some academic goal we have no shortage of volunteers for laboratory protection duties or to support our Army colleagues in Northern Ireland. In fact the enthusiasm of our dentists for the Service has never been higher. But there are still opportunities for free and statement to Surgeon Lieutenant General and had what he participated in the Round the World Sailing Race in the Navy's ship, aptly named *Atheneas*.

It would be impossible to talk of an education without mentioning the contribution of the Royal Naval Reserve for, during a year in which unexpected operational requirements have made the appointment of a task more than extremely difficult, some 32 RNR medical officers have served with the Royal Navy in Malta, Gibraltar, Naples, London and Hong Kong or beyond off Ireland and elsewhere. This is three times the number to previous years, and there appear to have stepped in to compensate because four have now transferred to the Royal Navy.

The caliber of our RNR officers is nowhere better expressed than in the valiant accompanying the rescue of the *George Melby* by Surgeon Lieutenant Commander Dally RNR, who displayed a singular degree of skill and courage in descending a canyon of unknown depth in the Chardale Arroyo to reach two injured members of the British Army And Warburg expedition. Under appalling weather conditions and in danger from falling blocks of snow and ice Surgeon Lieutenant Commander Dally abandoned his own rope to climb down on the breast of the injured at a depth of 180 feet then returning to the other end his rope around him climbed

to the surface and helped lead him to safety. I am sure you will wish to applaud this remarkable feat.

Earlier in the year the Institute sponsored a Symposium on Alcoholism which brought together doctors, chaplains and in personages of the Second Sea Lord and Commandant-in-Chief in fruitful discussion. Several naval medical officers also participated in two Symposia on Medicine at Sea, one at the Royal Northern Hospital and the other at the National Maritime Museum. Later this month we shall be hosting the CEMO Military Medical Conference in London. Finally and the list is not closed, I should like to thank the Director General Army Medical Services and Major General Church for so generously offering us the facilities of the RAMC Men's Club at Millbank.

The Third Symposium of Naval Medicine is being held on November 3 and 4 at the Royal College of Physicians in London. To underline the challenge and complexity of modern maritime medicine we have chosen as its theme 'Response to stress in a naval environment' which will afford an opportunity of reviewing the increasing contribution being made by the Medical Service to the operational efficiency of the Fleet.

It had already become apparent that the headquarters administration structure no longer provided an adequate framework for the growing complexity and variety of the new medical disciplines comprehended in modern maritime medicine in which today the Royal Navy stands in Europe. Only a few months ago I was afforded the privilege of leading a naval medical delegation to the first international meeting in dock-helm of the European Union. The medical Society is something new scientific, organisation which owes its origin largely to the initiation of naval operations in underwater medicine.

We have therefore been engaged during the past year in a radical reorganisation

of the Medical Department currently being mounted in the naval hospitals and their service systems in which we have retained ready help from Management Services and the Second Sea Lord's Department. I am glad to say that we have gained a Surgeon Commissioner in the process. My Deputy, Surgeon Commodore Dalgleish, becomes Director of Medical Personnel and Supplies and Surgeon Commander Rawlin leads a new directorate of Health and Research. This has already enabled us, on the one hand, to embark upon the long term planning necessary to an adequate mandatory post graduate training programme with the operational requirements of the Fleet and on the other to re-evaluate more effectively the critical factors relating to the health and well-being of the sailor and his family.

Our task has been made easier by an exhaustive survey of post graduate training in the Navy kindly undertaken by Mr. Nelson Taylor, Dean of the Royal Postgraduate Medical School and his colleagues. Professor Christopher Booth, while Mr. Brian Winkley and Dr. E. E. Pochon have reviewed our considerable commitments in the field of nuclear medicine with a view to long term planning of the various disciplines within that wide-ranging naval specialty.

I think you will therefore agree that my staff has used to advantage the long period of gestation which the Defence Medical Services Inquiry Committee apparently required in order to deliver its final verdict although I must add that the treatment of it which is an accepted format of presentation before was probably unavoidable but cannot to great extent be attributed to the number of members called in to the presentation.

From a novel point of view the Report might well be summarised in the words of an ancient Proverbium: 'in response not at no proper time progress. Happily that has been an attempt to explain the

uniqueness no one feared and such medical service means as characteristic identity. The report has been drafted mainly towards training and the Committee has drawn heavily upon the proposals of the First Report of Mr Harold Edwards Committee concerning the impact to be identified and the manner in which to be suggested they might be achieved. Mr Edwards is with us tonight and I think you would like me to express our appreciation of the work of his Committee in this field. His Second Report is of particular value to the Royal Navy because of the emphasis it gives back to emergency medicine and to those parallel disciplines which are the unique feature of naval medicine today. I am glad to say the Harrell Committee endorses this view as recommending an increase in consultant and specialist posts.

However, the Joint Report so far to the Royal Navy is concerned to show all its regard of a number of measures which have already been taken, particularly in regard to the medical education of doctors in medical education, general practice training, maintenance of administration and collaboration with the National Health Service, auxiliary departments and the other two Services. The naval hospitals are provided with the opportunity to form new arrangements which are already operating at Haver and Plymouth for the intake of local civilian patients and the recommendation that the training can be obtained bygone Captains be raised to 48 will receive favourable consideration.

The benefits are by no means confined to medical and dental officers. Most training is arranged for medical branch ratings and naval nurses with better professional opportunities for medical branch officers for whom we have already begun to plan better career patterns.

In conclusion, with a recent change in names of the Medical Service officers who has kindly lost his Warminster profile an

applicant no longer relevant to the importance young men who are now going forward for commission. In the past year the three medical branch technicians who were promoted to MR officer assigned themselves with distinction. In the various cases for SD officers, Sub Lieutenant Pollock was top candidate and earned all of the prizes, Sub Lieutenant Barker and Williams gained second and third places in the Spring course.

The medical education structure has been discussed recently by the introduction of a Pharmacy dispensing specialty and the Harrell Committee has recommended that the possibility of enhanced dental support from within the medical branch should be examined. The increasing number of alternatives now available to the medical branch rating, together with the improved status and responsibilities the Committee suggests, for him should guarantee that our medical recruitment figures will be maintained.

I am delighted to see in the Report a proper emphasis upon collaboration and it is a pleasure to have with us my colleagues the Directors General of the Medical Services of the Army and RAF, Lieutenant General Sir James Boyd and Air Marshal Sir Edwin Selby together with the Director of the RAF Dental Service, Air Vice Marshal Bennett. We all recognise that good hospital practice, skilled auxiliary support and high standards of training can only be achieved by the exploitation of joint resources in a spirit of mutual and friendly co-operation.

The machinery for administrative collaboration at the highest level has already been set up and a commissioned Defence Medical Services Co-ordinating Committee includes the three Medical Directors General.

There are therefore solid practical foundations to be derived from the Committee's Report which in my opinion will enable the Royal Navy to ensure the men and

in cases of high sailing the Service requires so the reward coming and reaching across the Service can now offer in the weeks which Shakespeare puts into the mouth of Brutus.

There is a tale in the office of man which takes of the blood leads on to Britain.

The Service Report has turned this tale in our favour.

And we must take the current when it serves or lose our moment!

We have such a large number of distinguished guests this evening that I have had to be in mention only a few by name, but I should like to give a particularly warm welcome to the President of the Royal College, Sir Edward Mear, President of the Royal College of Surgeons, in which I owe my personal allegiance Professor Clayton President of the Royal College of Obstetrics and Gynaecology, Dr Watson President of the Royal College of General Practitioners, and Professor Sir Martin Roth who has the distinction of being the first President of the Royal College of Psychiatrists. I should also like to include Professor Lawton President of the British Dental Association. From what you now know of the Service recommendations you will appreciate how much the Medical Services of the Armed Forces will depend upon their goodwill, their understanding of Service problems and their own consent of our high expectations for the future are to be realized. From personal experience I know they will not fail us.

It is also a pleasure to have with us my predecessor in office Sir Eric Woodbury, and I hope he is enjoying his evening.

Finally it is my pleasure to introduce our Guest of Honour, Vice Admiral Sir William Lewis, Vice Chief of Naval Staff, who has had a most distinguished career, serving during the Second World War in the Battleship *Pelham* and the destroyer *Albatross* in which he had his first share of

experience as gunnery in Malta, surgery in Russia, the invasion of North Africa and studies off the French coast. He was awarded the DSC and three times mentioned in despatches.

His post-war record has been equally impressive and the athletic ability which brought him to the attention of the naval service appears to have enabled him to make easily the easy transition to high office.

On assuming command of the aircraft carrier *Hermes* in 1946 the task of her return quickly won the allegiance of the ship's company and his discerning frontal brain might readily have been awarded credit for the fatherly interest of an old time general practitioner.

However his professionalism equally deflected that direction for his quick thinking and firm decision-making enabled *Hermes* to break every record ever in the matter of ports of Visit given by the ship's company to the point where the Red Cross was unable to cope with the supply.

Admiral Lewis has always shown great understanding of our medical problems and from personal experience I have learned that he is ready to share a few insights to our mutual advantage. It therefore gives us great satisfaction to know that on promotion he is to assume the important appointment of Commander of Fleet and I am confident he will be able to depend upon our loyal professional support. I know I speak for us all in saying how honoured we are that he has consented to be our Principal Guest this evening.

Members of the Royal Navy Medical Club I ask you to rise and drink to the health of our guests.

In making on behalf of the guests, Vice Admiral Sir William Lewis, RCB, MVO, DSC, Vice-Chief of the Naval Staff, made several references to the change in status that had been enjoyed by medical officers over previous centuries. He refers

suggested that they were getting better! He pointed out that two clinics referred to days of Rogers and Fox-Britton's long stay and he went on to pose the question: Is a rather more serious virus, whether the Niger and with it the naval medical profession was becoming an endemic one, was that we were part of Europe and no longer a power that could dictate the fortunes of the world. He went on:

"My President, Gentlemen, I do not think so. The sea is scarcely less important to this island than it ever was. Air transport handles only a tiny fraction of our imports and exports, even Channel Tunnel or bridges will not alter the situation much. We were a rather larder-conscious of our food then, we did, but that worry has not much more than half our needs. As for fuel, we cannot be the ocean we have well over half our total needs. And that is true for Europe too. For those being self-sufficient, the increasing prosperity of the Economic Community has forced almost demands made internally do not remove its leaders, remains less content to power its industry and on ever increasing overseas trade for its energies."

No doubt this dependence will be increased to some extent when oil from the North Sea comes on stream. But that won't do much more than satisfy the additional demands of growth in the next few years from the countries bordering the North Sea alone. We shall still need the Indian. What's more, North Sea oil is a symptom of an already new continent as the world's steadily diminishing and increasing use of the sea. Evidence for food, exploration of the natural wealth of the sea bed, the use of the sea for recreation, as well as transport, they are all continuing very fast. I've told the various doubts here in the use of the sea in 15 years. By comparison the doubling time of people are over in Latin America is over 25 years.

I wish I could say that this development in the use of the sea were likely to take place in an orderly way without conflict. But it seems very unlikely to be so. Many of the world's nations are now and determined to accept the old ways — they have their own ideas about sovereignty rights and provisions, and they want to cash in on the wealth that can be extracted from the sea. There are other nations extending very rapidly into sea others in a way they haven't done before. Soviet Russia is the prime example and they back it with a naval development that is both powerful and impressive. Britain is likely to be swept into every part of the sea, territory from naval interests to the control of pollution. The new nations of Africa et al. as I can see it over the next 10 or 20 years, does not look settled or peaceful. And our interests, and Europe's, are steadily involved.

That is it over the Royal Navy's horizon and its policies. By the workers of Rogers and ourselves we have a serious conflict in the increasing efforts of Europe. One should situation not create maritime forces with their traditions and experience our active membership of NATO as well as of the EEC and the crowd in which our maritime staffs are held on both sides of the Atlantic make it certain that we could we do not really think there a very one. Navy is bound to become the focus of European defence and deterrence at sea. We have of course to keep up our ships to match the same war as the naval doctor in quiet times, keeps up his. But there is the difference that he knows a medical emergency will come sooner or later while we hope if we keep ourselves and our circumstances sharp that we shall be able to keep the war at bay.

Admiral Llewellyn closed his speech on a light-hearted note thanking the President and members on behalf of the guests, for a most excellent dinner.

in some well-known English and French songs, and in the last chapter, the author discusses the influence of these songs on the development of the French and English folk songs.

Thus, this English chapter is an excellent example of the author's skill in the study of the development of folk songs — the French is equally well written by Mr. John Gosselin of Southampton, for the general approach is somewhat different. There is, for example, an discussion of the influence of the French on the English.

Now, then, a summary of the present state and the following chapters, which contain much more. It is recommended for those who are in the stage of English learning but cannot be, as, given in a short time, the reference to the *Anglo-Saxon Department*. P.C.T.

A Short History of English. By Nelson Taylor and J. Gosselin. (The author of the English and French chapters.)
 Pp. 114 + index. London: English University Press, 1970. Dated edition 11.45.
 Dated edition.

The book is in two parts, the first and second, and is a valuable reference work for the study of the English language. The first part is a short history of the English language, and the second part is a short history of the English language.

There are very useful chapters on the present state of the English language, as well as on the English language in the past. The book is a valuable reference work for the study of the English language, and it is recommended for those who are in the stage of English learning but cannot be, as, given in a short time, the reference to the *Anglo-Saxon Department*.

From the English point of view, the book would not be an additional source of the English language, but it is a valuable reference work for the study of the English language, and it is recommended for those who are in the stage of English learning but cannot be, as, given in a short time, the reference to the *Anglo-Saxon Department*.

The book provides a summary and comparison of the English language, which would be of value to many people, especially those who are in the stage of English learning but cannot be, as, given in a short time, the reference to the *Anglo-Saxon Department*. P.C.T.

English Language: A Short History. By Nelson Taylor and J. Gosselin. (The author of the English and French chapters.)
 Pp. 114 + index. London: English University Press, 1970. Dated edition 11.45.
 Dated edition.

There are many other useful chapters on the English language, and it is recommended for those who are in the stage of English learning but cannot be, as, given in a short time, the reference to the *Anglo-Saxon Department*. P.C.T.

It is, then, the first appendix, which is a short history of the English language, and it is recommended for those who are in the stage of English learning but cannot be, as, given in a short time, the reference to the *Anglo-Saxon Department*. P.C.T.

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LETTERS TO THE EDITOR

Sir,

Reference: Polysomnogram

I would wish to make some suggestions with a view to improving our standard of preventive medical care. This is particularly for personnel over a certain age, for example 40 years, or for telephone linemen, two fields of risk.

There would include:

1. **ELECTROCARDIOGRAM.** As not and also exercise. Inducible changes would appear and would also serve as a time line for the future.

2. **USE OF CATHETER** to measure standard deviation. There are several lines of change by former Laboratories in connection with these measurements of Polysomnogram (Polysomnogram). I find these subjects very useful and they also help to make the present apparatus less overworked by it.

3. **MECHANICAL MEASUREMENTS** (recording on a record reader). A blood sample is not good as a history of mechanical tests which can reach in the early detection of unexpected pathology and also serve as a time line. I consider these measurements and a typed profile as being of great importance.

The Technicon Instrument Company in Basingstoke performs these tests for a very reasonable cost, and I would suggest a mechanical profile every two years.

I would be interested to hear the views of other medical officers on this subject.

I am, Sir,

Yours sincerely,

Robert Marshall

Surgeon Lieutenant Commander RSM
FMQ. HMS Tiger

Sir,

To complement Lieutenant Gwynell's appraisal of postures given in the *Journal of the Royal Naval Medical Service* Vol 58 No 1, mention could be made of the Vietnam variety of splint, which is a web plastic plastic bag used with steel splint-like metal plates. On removing air from the bag through a valve, the plastic envelope, driven down, aggregating and compressing the particles into a rigid mass. This produces a rigid recovery-like splint which need not be immobilisation. It can be any shape, either square like a pillow or rectangular like a mattress. It provides excellent splinting to fractures of forearm and humerus (upper), and to fractures of the pelvis where a rigid splint is necessary for lifting and transport, and also to fractures where extension of the dislocation is undesirable, eg (1) distal humerus with fractures of bone ends where reduction could cause introduction of dirt into the depths of the wound, and (2) fractures around the elbow with risk of damage to the Brachial Artery.

These splints are lightweight, durable, not water- or sea-waterproof and relatively easy. They are easy to apply and remove, may be used over clothing and cause no secondary discomfort by compression of blood vessels. They do however require suction apparatus to apply, either by hospital popper system or Ambu type pump.

Group Captain Povey (RAF) has described their use in steady hands during operations.

I enclose photographs of a prototype pillow variety and of a proprietary full length one.



Fig. 1



Fig. 2

I am, Sir
Yours sincerely
Mered M. J. Alcock
MB ChB
Acting Surgeon Lieutenant Royal Navy

Kelowna, B.C., 1970, *Journal of Bone
and Joint Surgery*, 52B: 400



1966. Some of the staff of the Royal Society Medical Sciences, London, 1966. The man in the center is the author, who was then a medical student at the Royal Society Medical Sciences, London. He is now a senior lecturer in the Department of Medicine at the University of London. The man on the right is the author's brother, who is now a senior lecturer in the Department of Medicine at the University of London.

To Surgeon General: Surgeon-General C. C. Huxley
Lt. Col. J. D. Huxley, A. J. Huxley, J. M. Huxley
R. S. Huxley, P. F. Huxley, A. F. Huxley
and D. J. Huxley.

To Surgeon General: Surgeon-General C. C. Huxley
Lt. Col. J. D. Huxley, A. J. Huxley, J. M. Huxley
R. S. Huxley, P. F. Huxley, A. F. Huxley
and D. J. Huxley.

NEW PUBLICATIONS

Surgeon Lieutenant Commander J. J. Huxley
(Huxley).

Surgeon Lieutenant Commander R. C. Huxley,
Surgeon Lieutenant D. S. Huxley, M. F. Huxley
and D. J. Huxley.

Surgeon Lieutenant D. S. Huxley, M. F. Huxley
and D. J. Huxley.

Surgeon Sub-Lieutenant R. C. Huxley, J. J. Huxley,
Lt. Col. J. D. Huxley, A. J. Huxley, J. M. Huxley,
R. S. Huxley, P. F. Huxley, A. F. Huxley
and D. J. Huxley.

TRANSFERS TO THE PERMANENT AND RESERVE LIST

Surgeon Lieutenant Commander J. J. Huxley
(Huxley).

Surgeon Lieutenant D. S. Huxley,
Surgeon Lieutenant D. S. Huxley, M. F. Huxley
and D. J. Huxley.

Surgeon Lieutenant D. S. Huxley, M. F. Huxley
and D. J. Huxley.

TRANSFERS TO A YEAR REVENUEABLE LIST

Surgeon Lieutenant Commander J. J. Huxley
(Huxley).

Surgeon Lieutenant D. S. Huxley, M. F. Huxley
and D. J. Huxley.

Surgeon Lieutenant D. S. Huxley, M. F. Huxley
and D. J. Huxley.

PLACED ON THE RETIRED LIST

Surgeon Captain A. J. Huxley.

RETIRED ON COMPLETION OF SHORT SERVICE

Surgeon Lieutenant Commander R. C. Huxley,
Lt. Col. J. D. Huxley, A. J. Huxley, J. M. Huxley,
R. S. Huxley, P. F. Huxley, A. F. Huxley
and D. J. Huxley.

Surgeon Lieutenant D. S. Huxley, M. F. Huxley
and D. J. Huxley.

MEDICAL SERVICE OFFICERS

Surgeon Major J. J. Huxley, A. J. Huxley, J. M. Huxley,
R. S. Huxley, P. F. Huxley, A. F. Huxley
and D. J. Huxley.

Surgeon Lieutenant D. S. Huxley, M. F. Huxley
and D. J. Huxley.

Surgeon Lieutenant D. S. Huxley, M. F. Huxley
and D. J. Huxley.

Surgeon Lieutenant D. S. Huxley, M. F. Huxley
and D. J. Huxley.

Surgeon Lieutenant D. S. Huxley, M. F. Huxley
and D. J. Huxley.

QUEEN ALEXANDRA'S IMPERIAL NAVAL RESERVE SERVICE

Surgeon Major J. J. Huxley, A. J. Huxley, J. M. Huxley,
R. S. Huxley, P. F. Huxley, A. F. Huxley
and D. J. Huxley.

Surgeon Lieutenant D. S. Huxley, M. F. Huxley
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and D. J. Huxley.

Surgeon Lieutenant D. S. Huxley, M. F. Huxley
and D. J. Huxley.

medical service, for information on the situation.

FIFTH INTERNATIONAL LONDON AND CHRISTIAN

The event will take place at

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Programme: Conference Secretary: MR. H. H. Huxley, Room 100, Strand, London W1C 1LE.



Illustrated by courtesy of DPMO

11. Major J. G. Woodcock (Naval Reserve Pay, Admiral Lord, War, OBE) presents the 'Venerable and Most Hon. Chas. de la Motte of Naval Medicine' on October 11, 1911.
12. Major J. G. Woodcock (Naval Reserve Pay, Admiral Lord, War, OBE) presents the 'Venerable and Most Hon. Chas. de la Motte of Naval Medicine' on October 11, 1911.

UNDERSEA BIOMEDICAL RESEARCH

The Undersea Medical Society announces the launching of a major new scientific journal **UNDERSEA BIOMEDICAL RESEARCH**. The journal will publish major contributions in the field of hyperbaric/diving medicine and life sciences, dealing in particular with biomedical phenomena as influenced by the undersea environment. The first issue of the journal is planned for early 1984.

Subscriptions are available to non-members of the Undersea Medical Society at an annual rate of \$25.00 (includes postage). Members of the Undersea Medical Society receive the journal as a part of their annual dues. Subscription orders may be sent to:

Undersea Medical Society
Federation of American Societies for Experimental Biology
6600 Rockville Pike
Bethesda, Maryland 20814, USA

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